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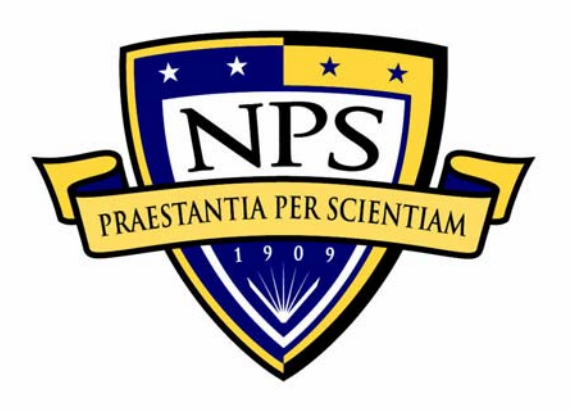
A qualitative analysis of the effect of the remedial physical conditioning program on retention and attrition as it relates to Semper Fit and the P2T2 account

Newcomb, Joseph Lewis, III

Monterey, California. Naval Postgraduate School



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

A QUALITATIVE ANALYSIS OF THE EFFECT OF THE REMEDIAL PHYSICAL CONDITIONING PROGRAM ON RETENTION AND ATTRITION AS IT RELATES TO SEMPER FIT AND THE P2T2 ACCOUNT

by

Joseph Lewis Newcomb III

March 2004

Co Advisor: Kathleen I Kujawa
Co Reader: William Decker Hatch II

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As the Department of the Navy and Marine Corps looks for efficiencies in Force End Strength Management and improvement to Sailor and Marine quality of life, Semper Fit may provide some answers. This research specifically focuses on the Marine Corps Body Composition Program (BCP) and Remedial Physical Conditioning Program (RPCP). The purpose is to qualitatively analyze a program for Marines who are overfat or on remedial physical training (PT) programs, focusing on the feasibility of Marines obtaining professional assistance from Semper Fit. The scope of this research evaluates existing programs and analyzes their beneficial affects in improving retention and attrition of RPCP Marines. The research shows that Semper Fit professionals would provide overfat and poorly conditioned Marines by USMC standards a consistent program through mandatory training in health, nutrition, and fitness. Semper Fit would directly support unit commanders with classes in nutrition, health, and fitness tailored for each RPCP Marine. Furthermore, this study validates the newly established Department of Defense Physical Readiness Test Standards recently adapted by the Department of the Navy as highly accurate. This study recommends the Marine Corps further expand Semper Fits role in support of the Marine and unit commander.

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A QUALITATIVE ANALYSIS OF THE EFFECT OF THE REMEDIAL PHYSICAL CONDITIONING PROGRAM ON RETENTION AND ATTRITION AS IT RELATES TO SEMPER FIT AND THE P2T2 ACCOUNT

Joseph L. Newcomb III
Captain, United States Marine Corps
B.S., Southern Illinois University, 1995

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Author: Joseph L. Newcomb III

Approved by Kathleen I. Kujawa
Co-Advisor

William D. Hatch II
Co-Advisor

Douglas A. Brook, Ph.D, Dean,
Graduate School of Business, and Public Policy

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ABSTRACT

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I. INTRODUCTION

A. OVERVIEW

Today, Marines entering the Corps are continually trained and challenged throughout their careers in physical fitness and martial arts. Physical fitness training must be second nature and vital in hand-to-hand combat with the enemy. The physical demands placed on these Marines after boot camp, must be delivered on a continuum regardless of pay-grade or military occupational specialty. Currently physical fitness training is primarily the responsibility of the individual unit commander. Most commands, such as infantry units, conduct physical fitness training on an ongoing basis. Infantry units are required to operate in various regions of the world carrying all their equipment and supplies in support of their physically challenging missions. Therefore, the nature of their job requires extreme physical fitness.

The lack of proper physical fitness directly affects a Marine’s performance. Marines and the equipment are constantly moved from place to place by wheeled, tracked, or airlift vehicles. Each Marine is required to carry their personal and mission critical equipment on and off each of these conveyances. Any lack of these physically challenging attributes contributes to mission degradation. The operational tempo of each unit varies with their assigned mission. Aviation and administrative type units, as compared to infantry and artillery units, are afforded less opportunity for regular physical training and consequently have a higher rate of Marines on the Body Composition Program (BCP) and Remedial Physical Conditioning Program

(RPCP).[1] Ultimately, without adequate time to exercise, a Marine's fitness level deteriorates.

The current Remedial Physical Conditioning Program (RPCP) is a process by which Marines are conditioned progressively to meet prescribed physical fitness and body composition standards. The RPCP goal is to provide challenging conditioning sessions, using a spectrum of aerobics, resistance and other related exercises that afford the Marines an opportunity to recondition themselves after a weight or body fat increase, injury/illness, pregnancy, or period lacking a structured fitness program.[2] In the RPCP order a few examples of remedial conditioning programs are outlined for units to employ as a guide to tailor their own program. Command PT Representatives can also access the resources available at Semper Fit Fitness Centers, which are staffed by qualified professionals and offer a variety of health and fitness services."[3]

The "bottom line" for this study is to qualitatively examine the current system and identify possible improvements with Marines who are placed in RPCP. This research will examine if a more consistent approach will return Marines to "readiness status" quicker. Improvements in the program could minimize lost work by remedial Marines, decrease disabilities due to compound injuries, and restore degraded mission readiness.

1 Data collected from the Defense Manpower Data Center (DMDC) on attrition breakdown for Marine Occupational Specialty during 1997 to 2003, showed a higher ratio in non-combat MOS's of Marines discharged for weight.

2 MCO 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

3 Ibid. MCO 6100.12 Appendix C.

B. PURPOSE

Attrition and retention in the Marine Corps are factors that cost the Corps precious resource dollars and lost work time. Every year manpower planners are faced with new challenges on how to replace Marines due to first-term attrition and retention. Manpower forecasters use models based on prior Years' data to construct and predict current and future year attrition and retention rates. Every year the Marine Corps loses tens of thousands of Marines for various attrition and retention issues. The data shows that hundreds of Marines are discharged for failing to meet weight standards.[4] These discharges could be reduced by examining the current procedures to determine if there is room for improvement in physical readiness. These discharges are due to weight, permanent injury and/or found medically unfit for duty, or the inability to maintain physical fitness standards. A realignment and minimal expansion of current programs that implements consistent training for individual Marines in nutrition, health, and fitness, could reduce the affect of these discharges on attrition while improving retention. The additional effects of such change would be to unit commanders not having to administer remedial PT programs, which further reduce available personnel for mission accomplishment.

C. SCOPE AND METHODOLOGY

This research will examine ways to expand current programs through a consistent approach that will support commanders with the tools and knowledge needed to return

4 Data collected from the Defense Manpower Data Center (DMDC) on attrition and retention during 1997 to 2003, showed Marines discharged for weight. In fiscal year (FY) 2001 and 2002 the Marine Corps discharged 46,867 and 48,808 Marines respectively. In FY2001, 87 and in FY2002, 38 were discharged for not making weight standards.

BCP and RPCP Marines to full readiness status. This expansion would help to prevent Marines from becoming overweight by amplifying the abilities of Semper Fit programs, designed around nutrition, health, and fitness that encourage and support healthy lifestyles resulting in increased productivity, reduced medical and disability costs, and greater mission readiness. Expanded programs could ultimately reduce the overall attrition of Marines discharged because of weight and poor fitness. MCO 6100.12, directs the administration of RPCP however, inconsistencies among different commands in its execution may be present. Additionally, a Marine Corps Institute (MCI) non-residence course on basic nutrition, health, and fitness is available to all Marines. The well-known fitness organization called Semper Fit that provides well-qualified nutritionists, personal trainers, and clinical exercise specialists is also available for Marines. Semper Fit offers specialized nutrition, health, and fitness classes to commands and individual Marines throughout the Corps.

A comparative analysis between different types of body composition methods will be examined regarding accuracy methods and the standard body composition method used by the Department of Defense (DoD). Additionally, various Marines will be interviewed on the different aspects of the RPCP program. Marines in the RPCP and Marines that influence the program will be interviewed through a wide range of questions. The questions will be used to qualify the psychological effects of Marines after being placed on a remedial program. This will be done in order to determine a course of action and make recommendations for further testing.

The research will conclude with funding considerations for expanding the capabilities and utilization of Semper Fit. It will also recommend improvements to commanders to work directly with Semper Fit professionals. The intent is to provide commanders a consist means to administer remedial programs, a smoother return of Marines to readiness status, and increased awareness in preventing problems leading to the placement of Marines in remedial programs. Final recommendations will include a “pilot” test program of various Marine units with similar operations and operational tempo conducting RPCP and the cost benefit analysis associated with implementing new programs Marine Corps wide.

D. ORGANIZATION OF STUDY

The organization used in this thesis will continue in chapter two, with an analysis of several different methods used to determine body fat composition. It will compare the most accurate method used today (four compartment) to the Department of Defense (DOD) circumference method. It will conclude with more than ten years of data used in the development of current body composition models from samples taken at the Naval Health Research Center (NAVHLTHRSCHCEN), in San Diego, California.

Chapter III will amplify the mission and purpose of Semper Fit to include programs offered, types of facilities, training of professional personnel, and future programs. It will conclude with a description of the DoD, Air Force, Army, and Navy health and fitness programs. Chapter IV will break down the requirements for remedial physical fitness programs; the psychological factors placed on Marines in the program, and define the return to

readiness policy. The psychological factor will then be used again in chapter five for a qualitative comparison of Marines interviewed both on the remedial program and on those who oversee it.

Chapter VI will end with a summary, conclusions, and considerations found in this study. There will also be recommendations that further studies are completed in areas of cost benefit analysis and a pilot test to be completed in remedial programs with differing demographics.

II. BODY COMPOSITION METHODS

A. OVERVIEW

Body Composition, in its simplest form, includes two components called fat-free weight and fat weight. Fat-free weight can be further broken down to body water, muscle, bone, and organs. Fat is vital in the proper functioning of a healthy human body. Body fat can be characterized as essential fat and non-essential (excess) fat. However, too much or too little fat can become an increased health risk and give an appearance of an unhealthy person.[5]

> Excessive body fat has been demonstrated to be associated with such health-related problems as coronary artery disease, hypertension, adult-onset diabetes, hyperlipidemia, obstructive pulmonary disease, and osteoarthritis. Too little fatness, as seen in individuals with eating disorders, exercise addiction, and certain diseases, such as cystic fibrosis, can also lead to serious physiological dysfunction.[6]

Body composition methods are based on the measurement and study of the human body and its parts, size, proportions, known as “anthropometry.” The goal of anthropometrically-based body fat estimation methods is to find anthropometric measures which will serve as valid representatives of body fat.[7]

Anthropometry capitalizes on the association between body measurements such as skinfold thicknesses or

5 Body Composition, Diet, and Exercise Study, Naval Health Research Center, San Diego, CA

6 Heyward, V. H., & Stolarczyk, L. M. (1996). Applied body composition assessment. Champaign: Human Kinetics.

7 COMPARISON OF CIRCUMFERENCE-BASED AND SKINFOLD-BASED BODY FAT ESTIMATION EQUATIONS K. I. Kujawa and J. A. Hodgdon, FACSM Med Sci Sports Exer 30 (Suppl 5): S277, 1998, Naval Health Research Center, San Diego, CA.

circumferences and body fat. Measurements are taken and then used in equations that calculate body density and percent body fat. [8]

Today there are several methods available to determine body fat. Some methods are better than other methods and may require special training, equipment, or high costs. To simplify this process, the Department of Defense has chosen a method called the Circumference Tape Method that uses a simple fiberglass tape measure.[9] This method was developed and extensively validated at the Naval Health Research Center, San Diego, California. Validation was against the criterion method of four-compartment body composition analysis. The circumference body composition method, along with other methods will be discussed in detail during this chapter.

B. GOLD STANDARD

Hydrostatic weighing has long been considered the "Gold Standard" for estimating body fat in humans. The relation between an individual's weight underwater and their weight on dry land can be used to determine body volume, from which body density can be derived. Since body fat is less dense than water, increasing body fat leads to decreased body weight underwater and decreased body density. Since residual air in the lungs is also lighter than water, this "residual lung volume" is measured prior to underwater weighing and subtracted when calculating body volume. The individual being weighed expels as much air as possible while underwater before the underwater weight is

[8] Department of Defense Instruction 1308.3 DoD "Physical Fitness and Body Fat Program Procedures," November, 5 2002.

[9] Ibid.

taken. Six to eight weights are taken to ensure that the individual has mastered the technique of expelling all air while underwater. A comparison of underwater weight and weight measured in air will allow for an accurate measure of body volume. From volume, body density can be calculated. Percent fat is then estimated using the equation developed by Siri in 1961.[10] However, hydrostatic weighing has drawbacks in that it requires specialized equipment and trained technicians to conduct the testing. Another consideration is that some individuals have difficulty performing the test correctly due to either physical conditions or psychological factors. Time is also a factor, with an individual test taking approximately one hour to complete.[11]

A “Gold Standard” is considered to be the best method to predict body composition with current technology.[12] This standard is used as the criterion method against which regression models for other body composition methods are developed. Today the hydrostatic method is no longer the current gold standard when dealing with racially diverse populations. The currently accepted best criterion measure is the four-compartment method. Hydrostatic weighing was considered the best criterion in the past, but was supplanted with the advent of the four-compartment method upon development of easy ways to measure bone density. When briefly discussing the assumptions about hydrostatic

10 Siri, W. E. 1961. Body composition from fluid spaces and density: analysis of methods., p. 223-244. In J. Brozek and A. Henschel (eds.), Techniques for measuring body composition. National Academy of Sciences, Washington, DC.

11 COMPARISON OF CIRCUMFERENCE-BASED AND SKINFOLD-BASED BODY FAT ESTIMATION EQUATIONS K. I. Kujawa and J. A. Hodgdon, FACSM Med Sci Sports Exer 30 (Suppl 5): S277, 1998, Naval Health Research Center, San Diego, CA.

12 Heyward, V. 2001. ASEP recommendation: Body composition assessment. J. Exer. Physiol. 4:1-12.

weighing, body fat is calculated using equations, which assume constant density for fat mass between individuals but also assume constant densities for fat-free mass. While the density of fat does not vary substantially between individuals, the density of the fat-free mass can vary significantly. In order to account for the variation in density of fat-free mass, the four-compartment method was developed. This method adjusts for the major differences in fat-free mass density by measuring bone mineral density and total body water.

C. FOUR-COMPARTMENT BODY COMPOSITION ANALYSIS

The Four-Compartment Body Composition Analysis has been shown to be a better measure of body fat, when estimating body composition on a diverse, racially mixed, athletic, population (typical of the U. S. military).[13] In order to account for the variation in density of fat-free mass, the four-compartment method was developed. This method adjusts for the major differences in fat-free mass density by measuring bone mineral density and total body water. This criterion measure is used to come up with the most accurate standard to model other easily deployed "field" equations such as, the Circumference Tape method.

The four-compartment body composition equation used by NAVHLTHRSCHCEN was developed by COL Karl E. Friedl, USA, and colleagues and includes the following measurements:[14]

- Total Body Water (TBW). This method uses a Xitron 4000B bioimpedance analyzer (Xitron Technologies,

13 Interview with Doctor, K. I. Kujawa, December, 2003, Naval Health Research Center, San Diego, CA.

14 Friedl, KE, JP DeLuca, LJ Marchitelli, and JA Vogel. 1992. Reliability of body-fat estimations from a four-compartment model by using density, body water, and bone mineral measurements. American Journal of Clinical Nutrition 55:764-770.

San Diego, CA). Used to determine whole body resistance at 50kHz. Total body water was calculated using the gender-specific equations of Kushner and Schoeller (1986).[15]

- Bone Mineral Content (BMC). Whole-body bone mineral content was determined using a Hologic dual energy X-ray absorptiometer. This method is used to determine bone density.

- Body Density (BD). Residual volume is determined prior to hydrostatic weighing by the helium dilution method of Ruppel (1975).[16] Weights from hydrostatic weighing were determined using a Model TI 2100 electronic scale. The signal from the scale was smoothed and stable weights obtained on a PC with software developed at NAVHLTHRSCHCEN. Body density was calculated according to the formula of Buskirk (1961).[17] Total body density is determined using hydrostatic weighing, correcting for residual lung volume and intestinal gas. Fat density is assumed constant. Lean body density varies considerably among individuals. Four-compartment body composition analysis adjusts lean body density for bone mineral content and total body water. The four resulting body composition compartments are: fat, water, bone mineral, and residual lean mass.[18]

- Anthropometry. Height and weight were measured on a balance scale with an attached anthropometer. A total of 15 circumferences (fiberglass tape measure), and 10 skinfolds (Harpenden skinfold calipers), were taken on each subject following standard procedures for the applied physiology laboratory of Naval Health Research Institute.[19]

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[15] Kushner, R. F., and D. A. Schoeller. 1986. Estimation of total body water by bioelectrical impedance analysis. American Journal of Clinical Nutrition 44:417-424.

[16] Ruppel, G. (1975). Manual of Pulmonary Function Testing. St. Louis, MO: C. V. Mosby Co.

[17] Buskirk, E. R. (1961). Underwater weighing and body density: a review of procedures. In: Brozek, J., and A. Henschel (eds). Techniques for Measuring Body Composition. pp. 90-106. Washington, DC: National Academy of Sciences - National Research Council

[18] http://www.nhrc.navy.mil/programs/BodyFat/methods.html

[19] Beckett, M. B., and J. A. Hodgdon. 1984. Technique for Measuring Body Circumferences and Skinfold Thicknesses. Naval Health Research Center Technical Report No. 84-39.

Each of these methods when combined into the Four-Compartment Body Composition Model to determine body fat content was shown to reduce the error variance associated with body fat content. This gives a more accurate measure of body fat and eliminates a systematic difference in body fat content estimation associated with ethnicity. When used as a criterion measure for the circumference method the error is smaller when compared to the hydrostatic method alone.[20],[21]

D. DUEL X-RAY ABSORPTIOMETRY

Duel-energy X-Ray Absorptiometry (DEXA) imaging is a non-invasive imaging test utilizing very low-dose radiation. The primary system components include an x-ray source, which generates photons at two different energies, as well as a photon detector and an integrated computer system. Various body tissues attenuate the two x-ray energies differently allowing differentiation between bone mineral and soft tissue.[22] In addition, soft tissue composition can be further distinguished into fat and fat-free tissue. Additionally, DEXA capabilities include determination of total body tissue composition to include percent total body fat and fat-free soft tissue as well as Bone Mineral Density (BMD). This data is not routinely obtained on standard axial DEXA studies. However, these measurements have been utilized in various aspects of sports medicine, endocrinology, and pediatrics, in

20 Hodgdon, J. A., and K. Friedl. 1998. Development of the DoD Body Composition Estimation Equations. Naval Health Research Center Technical Report No. 99-2B.

21 Kujawa et al., 1999. Reliability of a four-compartment body fat estimation technique. Medicine & Science in Sports and Exercise, 31(5):S203.

22 Pietrobelli, A. Dual-energy x-ray absorptiometry body composition model: Review of physical concepts. Am J Physiol 271 (Endocrinol Metab 34):E941-E951; 1996.

management of patients with chronic illnesses, and in those patients undergoing various therapies and participating in clinical trials.[23]

Although DEXA is used more as a criterion method for body composition assessment, the NAVHLTHRSCHCEN does not consider it the "gold standard." There are still problems that need to be worked out with this method. For example, in the NAVHLTHRSCHCEN laboratory, findings show a significant difference between percent body fat determined by DEXA analysis and percent fat determined by four-compartment body composition analysis. DEXA percent fat is consistently over-estimated compared to four-compartment percent fat (mean difference = 1.46% for males and 2.95% for females from the NAVHLTHRSCHCEN data). Paired-samples t-test is significant at $p < 0.01$. Prediction of four-compartment percent fat from DEXA fat results from the NAVHLTHRSCHCEN data results in an R of 0.920, SEE of 2.61 for males and an R of 0.904, SEE of 2.96 for females (data from NAVHLTHRSCHCEN). They also found that the difference between DEXA percent fat and four-compartment percent fat increases as body fat increases, which partially explains the greater mean difference for females compared to males. It also appears that different DEXAs behave differently. Some studies report that DEXA underestimates percent body fat compared to four-compartment body fat and others find significant differences between machines in prediction of percent body fat. DEXA is very useful for estimating body

23 Baker, L. M.D, Osteoporosis Assessment with Dual Energy X-Ray Absorptiometry (DXA) April, 2000 http://www.radiologybyrmg.com/referring_doctor_services/DXA%20Newsletter.html

composition; however, one needs to be aware of the limitations.[24]

E. BIOELECTRIC IMPEDANCE

Bioimpedance is based upon the physics of electrical conductance in living tissues. Fat resists electrical current to a greater degree than muscle tissue and body water. The technique involves attaching surface electrodes to various locations on the arm and foot. Alternatively, the patient can stand on pad electrodes. [25] Resistance to electrical current for the whole body can be measured at specific electrical frequencies and the relationship between the resistance and body composition can be determined by the use of mathematical equations; the equations are validated against body composition determined by hydrostatic weighing. This method probably has the widest range of accuracies of any method because there are some equations that work quite well, while the “body fat meters” and other home-based or gym-based devices are usually very inaccurate.[26]

F. SKINFOLD CALIPER

Skinfold caliper tests have commonly been used when developing anthropometric equations for estimating body fat due to their well-known association with total body fat.[27]

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24 Interview with Doctor, K. I. Kujawa, December, 2003, Naval Health Research Center, San Diego, CA.

25 Whole Body Dual X-Ray Absorptiometry (DEXA) to Determine Body Composition Description http://www.regence.com/trgmedpol/radiology/rad41.html, policy 41, Dec, 2003

26 Interview with Doctor, K. I. Kujawa, December, 2003, Naval Health Research Center, San Diego, CA.

27 Roche, A. F. 1996. Anthropometry and Ultrasound. In: A. F. Roche, S. B. Heymsfield, and T. G. Lohman (eds) Human Body Composition, Ch. 9, pp. 167-189. Human Kinetics: Champagne, Illinois.

The development of skinfold (anthropometric) measurement came as the result of investigations for simpler and less expensive methods of estimating body composition. Body circumferences and/or skinfold thickness are used in a regression equation, of which there are many available, for prediction of body composition.[28] The thickness of a double layer of skin and the subcutaneous fat beneath it is measured with the special caliber that exerts a constant tension on the site. Skinfolds must be taken at precise standard locations if the results are to be reliable and used for comparative purposes.[29] Several different skinfold methods are used in determining body fat percentage which include, Behnke and Wilmore, Durnin and Womersley, and Jackson and Pollock 3-site and 7-site (men) Jackson, Pollock, and Ward (women). [30],[31],[32],[33]

The skinfold test is best at determining body fat over the range of normal body fatness (not good at the extremes). The equations are termed “generalized,” though, because they were developed on a population that included a broad range of folks (a “general” population), rather than on a very narrow range of folks (e.g., high school football players). Because they were developed using a general population, they can be applied to other folks who might

28 http://www-rohan.sdsu.edu/~ens314/skinfold.htm

29 Katch, F.I., McArdle, W.D. 1983, Nutrition, Weight Control, and Exercise. Lea & Febiger: Philadelphia. PA.

30 Behnke, A. R., and J. H. Wilmore. 1974. Evaluation and Regulation of Body Build and Composition. Prentice-Hall, Inc.: New Jersey.

31 Durnin, J. V. G. A., and J. Womersley. 1974. Body fat assessed from total body density and its estimation from skinfold thickness: measurements on 481 men and women aged from 16 to 72 years. British Journal of Nutrition 32:77-97.

32 Jackson, A. S., and M. L. Pollock. 1978. Generalized equations for predicting body density of men. British Journal of Nutrition 40:497-504.

33 Jackson, A. S., M. L. Pollock, and A. Ward. 1980. Generalized equations for predicting body density of women. Medicine and Science in Sports and Exercise 12:175-182.

make up such a “general” population.[34] Generalized equations tend to be less accurate with the very lean, obese, young and old, or other special populations. Other, more appropriate, equations have been developed for such populations, which increase their accuracy for prediction of body composition. However, a major source of error in anthropometry lies in the actual skinfold measurement. Making accurate skinfold measurement is more than simply pinching the skin somewhere around a particular area and measuring the thickness. There are precise sites on which the measurements are to be taken. A well-trained technician can obtain results that approach the precision of underwater hydrostatic weighing. Unfortunately, most people who take skinfold measurements are not well trained. Obtaining consistently accurate skinfold measurements requires training and experience.[35]

G. BODY MASS INDEX

Body mass index (BMI) has become the medical standard used to define obesity. BMI is an estimate used to determine if a person may be at health risk due to excessive weight. BMI is defined as weight (in kilograms) divided by height (in meters) squared. Healthful weights have been defined as those associated with a BMI of 19 to 25, the range of lowest statistical health risk. A BMI 25.0-29.9 is classified as being “overweight” and a

34 Interview with Doctor, K. I. Kujawa, December, 2003, Naval Health Research Center, San Diego, CA.

35 Katch, F.I., McArdle, W.D. 1983, Nutrition, Weight Control, and Exercise. Lea & Febiger: Philadelphia. PA

significant health risk. A BMI of 30.0 and greater is classified as obesity.[36]

The American Health Foundation's Expert Panel on Healthy Weight has proposed the concept of a "healthy weight target," which is a BMI of 19 to 25, and a second concept of "healthier weight goals" for persons above the target (BMI >25). For these persons a more healthful weight goal would be to decrease body weight by 1 or 2 BMI units (approximately 4.5 to 7.3 kg or 10 to 16 lb. below current weight) to reduce disease risk and improve health problems. Programs should, therefore, focus on improving health through small weight losses that are achievable and maintainable. This new BMI should remain stable for more than six months before further attempts are made to lower BMI; this would be an improvement over the increase in weight normally seen with aging.[37]

BMI is not a perfect science and will not fit every population. The NAVHLTHRSCHCEN has statistically shown that individuals with larger muscular mass will tend to have a higher BMI.[38] In some cases, Marines with over 25 BMI units have had a body fat of less then 18 percent. This is because the general population of Marines is more muscular and therefore weighs more, due to the nature of Marine training.

36.U.S. Department of Health and Human Services, Center for Disease Control and Prevention; National Center for Health Statistics, Maryland. Prevalence of Overweight and Obesity Among Adults: United States, 1999.

37 Meisler JG, St Jeor S. Summary and recommendations from the American Health Foundation's Expert Panel on Healthy Weight. Am J Clin Nutr. 1996;63(suppl);1:474S-477S.

38 Interview with Doctor, K. I. Kujawa, December, 2003, Naval Health Research Center, San Diego, CA.

H. CIRCUMFERENCE MEASUREMENT

The circumference measurement is currently the best predictor of body fat for use by the Military. This is because we have so many people with minimal training performing the body fat measurements, so an accurate, yet simple to learn, technique was necessary. This technique was developed by the NAVHLTHRSCHCEN and validated against the four-compartment method mentioned previously. All of the anthropometry-based equations currently in use, including the circumference-based equations used by the U. S. Navy and Marine Corps, have been developed using hydrostatic weighing as the criterion method.[39] However, the U. S. armed forces now all use body fat estimation equations based on the circumference measurements that use the same equation. Circumference measurements have an advantage over skinfolds and bioelectric impedance in that they are quicker and easier to learn, measurement is more precise (better reliability), and they require a single fiberglass measuring tape.[40] It also does not require specialized equipment. This is of particular value in the armed forces, where each command must train several individuals to perform circumference measurements. Since turn-over is high, new individuals must frequently be trained. However, circumference measurements measure not just the fat at a particular location on the body, but also the muscle, bones, and internal organs present at that location. The assumption is made that increases or decreases in circumferences are due to increases and

39 COMPARISON OF CIRCUMFERENCE-BASED AND SKINFOLD-BASED BODY FAT ESTIMATION EQUATIONS K. I. Kujawa and J. A. Hodgdon, FACSM Med Sci Sports Exer 30 (Suppl 5): S277, 1998, Naval Health Research Center, San Diego, CA

40 Heaney, J. H., J. A. Hodgdon, M. B. Beckett, and J. E. L. Carter. 1998. The technical error of measurement for selected skinfold and circumference measurements. Medicine and Science in Sports and Exercise 30:S276.

decreases in fat and not some other component of the body, such as muscle or body water. The assumptions made about the relationships between anthropometric measurements and body fat may introduce error into prediction of percent body fat.[41]

I. MARINE CORPS METHOD

Twice a year, between 1 January through 30 June, and 1 July though 31 December, all Marines must weigh-in prior to or after a Physical Fitness Test (PFT). This weight is then compared to a chart found in the Marine Corps Order (MCO) 6100.12 Marine Corps Physical Fitness Test and Body Composition Program Manual. The Marine Corps' weight and body fat standards are health and performance based, and not based on appearance. Marines are considered not within these standards when their body weight and body fat exceed the maximum limits as contained in the MCO. If tested and the Marine's percent body fat exceeds the maximum limit (18% for males, 26% for females), then he or she will be evaluated by the Marine's physical performance during semi-annual PFT. If the Marine does not meet the Physical Performance Evaluation criteria, then the command will have the Marine evaluated by a Medical Officer and assigned to a Body Composition Program (BCP). Marines assigned to the BCP will receive assistance in reducing body weight, in particular, body fat, in order to attain and maintain a more healthy physical fitness state. Body fat will be estimated using the circumference-based method with one set

41 COMPARISON OF CIRCUMFERENCE-BASED AND SKINFOLD-BASED BODY FAT ESTIMATION EQUATIONS K. I. Kujawa and J. A. Hodgdon, FACSM Med Sci Sports Exer 30 (Suppl 5): S277, 1998, Naval Health Research Center, San Diego, CA

of measurements for each gender.[42] No substitute methods of assessment are permitted.

The current system measures an overweight Marine by several steps. First, a Marine is weighed in pounds and measured in height in inches. The weight is then compared to a chart (see appendix B) by height in inches, according to the MCO. If that Marine is overweight he or she is then measured by the "circumference tape method" to determine percent of body fat. This method is calculated by measuring the Marines neck size and waist size for men, and in addition the hip size for woman, then subtracting the difference, waist minus neck (men) and waist plus hips minus neck (women). The difference is used against a chart by height in the MCO (see appendix C) to determine percent of body fat. These measurements are then used to calculate the composite body fat percentage in accordance with the MCO. Marines over the maximum fat are then allowed a four percent increase in fat percentage if they perform a first class physical fitness test (PFT). This allowance was determined by a greater than three percent standard error of estimate.[43] If a Marine could not achieve a first class PFT and or was over the maximum fat they are then placed in a remedial PT program.[44]

This DoD directed method of body fat estimation has been carefully evaluated for applicability to service members and represents the best approach that can be applied with minimal error plus or minus three percent for

42 MCO 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

43 The Physical Performance Evaluation accommodates for the acknowledged margin of error in body fat estimation and testing, normally a variance of 3 to 4%.

44 MCO 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

both men and women. This method is also valid because of the emphasis on abdominal circumference, the site of human body fat deposition which is most strongly associated with health risks, and which corresponds to other military goals including appropriate appearance and healthy exercise habits.[45]

J. CHAPTER SUMMARY

The above-mentioned methods in determining body composition all have their advantages and disadvantages. Most require special training and equipment that will not fit in the high operational tempo of the Navy and Marine Corps. Studies done by the Department of Defense (DoD) have found the circumference method to be the best choice for body composition because of its accuracy and ease of use. Its regression formulas have been validated against the four-compartment body composition analysis, which, with the different ethnic backgrounds found within the military, best predicts body fat percentage for the overall population.

45 Ibid.

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III. SEMPER FIT

A. INTRODUCTION

Semper Fit is the Marine Corps' premier organization that promotes healthy lifestyles, representing nutrition, health, and fitness. It provides this service to active and retired service members, DoD employees, and their families. It falls under the staff cognizance of the Deputy Director for Programs. Semper Fit is responsible for providing Marine Corps plans, policy, and resources to improve and sustain the capabilities of commanders to promote healthy lifestyles through fitness, health promotion, sports, and leisure programs.

B. BACKGROUND

Semper Fit was established in 1999 to be a comprehensive, synergistic, program, serving as the center of gravity on healthy lifestyles in the Marine Corps. The components of the Semper Fit Program are Fitness and Health Promotion (which include nine educational elements: tobacco use prevention and cessation, physical fitness, injury prevention (includes back and knee injury prevention), nutrition, stress management, suicide awareness, alcohol and substance abuse prevention and control, early identification and control of hypertension, and sexually transmitted disease prevention), Sports and Athletics, Community Recreation (Recreational Aquatics and Outdoor Recreation), Parks and Recreation, and the Single Marine Program (SMP). Semper Fit, through its various program elements, provides commanders the necessary tools to keep Marines in peak physical and mental condition. For the Corps, these benefits translate into increased productivity, enhanced performance, lower attrition and health costs, an overall increase

in retention, mission readiness, and quality of life.[46]

Embracing the Commandant's Planning Guidance (CPG), which states that the "willingness to embrace change is one of the Corps' great strengths," Semper Fit has adopted "reaching forward" as its guiding philosophy in planning for tomorrow. However, Semper Fit is more than just a simple change in philosophy, it is also about shifting/altering old paradigms, embracing new methods/technology, and changing the way we do business that ensures Semper Fit stays current and continues to meet the future needs of the Corps. The role of Semper Fit helps to provide Marines in combat readiness, building communities, and highlights some of the new initiatives, partnerships and ways Semper Fit is "reaching forward" to deliver healthy lifestyles and remain relevant to the needs of unit commanders.[47]

For Marines to remain mission ready they must be in peak physical and mental condition therefore, every Marine is an athlete. In today's operational environment, the Marine Corps have so many of its forces positioned forward for action, therefore, physical fitness translates into mission capabilities and overall mission accomplishment. Physical fitness must be at peak levels with the current threat levels since 9/11 and the Iraq War. Fitness is no longer justified by working out in the installation gym or performing twice a year for the PFT. Fitness must be constant, consistent, and available wherever Marines are

46 Marine Corps Order P1700.29 Marine Corps Semper Fit program Manual, November, 1999.

47 Ibid.

stationed or deployed. This is why Semper Fit is an important and necessary capability for the Corps.[48]

Marines have always known the value of physical fitness as it relates to mission accomplishment. For the Corps, fitness translates into increased productivity, enhanced performance, lower attrition and health care costs and an overall increase in mission readiness and quality of life. As about 70 percent of our Corps' budget is in manpower, it makes sense that we invest in those activities that keep this investment healthy, productive, and able to produce at optimal performance.[49]

Reinforcing the message of fitness and operational readiness is the current collaboration between Semper Fit and the Training and Education Command (TECOM). In development are a series of Marine Corps Institute courses focusing on Fitness, Nutrition, and Injury Prevention. Assisting in the effort to provide the latest techniques and information for these courses are three of the top national fitness associations, the American Council on Exercise (ACE), the American College of Sports Medicine (ACSM), and the National Strength and Conditioning Association (NSCA). Another tool available to commanders, and a new initiative, is the web based health promotion lesson plans on the Semper Fit website for self-directed distance education or group instruction forums. These combined efforts illustrate the strides the Corps has made with Semper Fit becoming the "center of gravity" for health and fitness within the Marine Corps.[50]

48 Marine Corps Order P1700.29 Marine Corps Semper Fit program Manual, November, 1999.

49 Ibid.

50 Ibid.

Physical fitness is a major force multiplier; however, Semper Fit must be looked at in a holistic manner. Rest and relaxation play a vital part of the readiness equation. Marines cannot keep themselves at an optimum performance level by training every day. Semper Fit offers many well-balanced programs such as recreational aquatics, Parks and Recreation, outdoor recreation, and the Single Marine Program (SMP). These programs help build a sense of community within the Corps and are as vital to operational readiness as physical fitness.[51]

C. PURPOSE

1. Programs

a. Sports and Athletics

Sports and athletics have always been an integral component of the support provided to Marines in order to expose them to the health benefits associated with participating in organized competitive events. Sports and athletics are a tool in the development of a "fighting spirit" and their contribution to fostering esprit de corps has long been noted. Additionally, these activities contribute to the sense of community. [52]

In an effort to reach a younger audience, Semper Fit recently began supporting Marines in competitive and adventure events not scheduled on the Armed Forces or All-Marine Sports calendar. These "Expanded Sports" initiatives include activities such as Ironman Hawaii Triathlon, BMX Bike Racing, Weight Lifting, Body Building, Mountain Bike Racing, Judo, Shooting (Skeet), and Archery. [53]

51 Ibid.

52 Ibid.

53 Ibid.

b. Parks and Outdoor Recreation

The benefits associated with outdoor recreation are well known. The increase in self-esteem, feelings of general well being, improved health, and self-confidence are benefits that contribute to the Marine Corps' quality of life (QOL), retention, and readiness. To that end, Semper Fit recently completed a study of Marine Corps installation outdoor recreation programs. This study identified specific areas for improvement such as staffing, training, and technology, and provided a clear direction for Semper Fit in its efforts to provide a high quality, balanced, outdoor recreation program. [54]

Semper Fit's recent agreement with the National Recreation and Parks Association (NRPA) to participate in their nationally recognized "Hearts N' Parks" will further assist Marines and their families. This initiative is a community-based program that can help build healthy communities. This program, supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health, aims to reduce the growing trend of obesity and risk of coronary heart disease. Six Marine Corps installations located at Cherry Point, Camp Lejeune, Parris Island, Beaufort, Camp Pendleton, and Hawaii have agreed to serve as pilot sites for this program. "Reaching forward" with partner organizations, such as NRPA will allow us to extend our reach in delivering quality health promotion, education, physical fitness, and recreation programs to our Marines and their families. [55]

54 Ibid.

55 Ibid.

c. Single Marine Program

The importance of the SMP can be demonstrated best by sharing a few manpower statistics. Approximately 57 percent out of roughly 176,000 Marines are single. This represents the highest percentage of single personnel throughout the Armed Services. The Marine Corps is a relatively young force, 70 percent are in their first term, while 15 percent, or nearly 28,000 are teenagers. Because of these demographics, the SMP must not just simply "be there" but must "Reach Forward." [56]

Thanks to the SMP, single Marines are making a difference on and off base, and they have the knowledge and resources to make good use of their leisure time and an outlet to get involved in the community. Making a difference and "reaching forward," Single Marine Council meetings have been the conduit to resolve and improve issues related to barracks conditions, chow halls, and safety issues such as hazardous intersections. In yet another SMP success story, single Marines across the Corps have contributed hundreds of hours of volunteer efforts to projects such as Habitat for Humanity, Special Olympics, food drives, and mentoring programs. [57]

2. Training of Staff and Instructors

Semper Fit employs a staff of highly qualified professionals that are trained in a variety of specialties in nutrition, health and fitness. Their expertise provides Marines with top quality assistance in all areas of healthy lifestyles that are the back bone in Marine Corps success. These fitness centers have fitness and health promotion

56 Ibid.

57 Ibid.

directors, certified personal trainers, clinical exercise specialists, and lifestyle weight management consultants to address a variety of fitness and nutrition needs for Marines and their families. HQMC annually conducts training to ensure our personnel are appropriately trained and certified.

a. Clinical Exercise Specialists

The Marine Corps maintains a high quality Semper Fit staff to ensure their personnel are viewed by Marine Corps leaders as their "special staff officers" in caring for their Marines. In an effort to bridge the gap between the medical and fitness fields, the American Council on Exercise (ACE) brought together the nation's top health/fitness specialists to develop a new advanced certification that certifies skilled fitness professionals to step in where traditional healthcare leaves off. The Semper Fit advanced fitness course, titled the "Clinical Exercise Specialist" is a national certification offered in many locations throughout the country. This training provides Semper Fit personnel with the credentials and competencies necessary to partner with Navy Medical to assist individual Marines and family members recovering from various diseases and injuries. Clinical Exercise Specialists (CES) fill the missing link between Physicians and Personal Trainers. This training is part of building our capabilities to deliver operational results where Marines are fit and ready. [58]

With the additional certification physicians can now recommend and/or rely on clinical exercise specialists, a part of the ACE advanced personal trainer certification

58 Ibid.

that deals specifically with exceptional populations. A CES is qualified to design a wellness and exercise program for "special" clients who may have certain medical conditions, such as heart disease, hypertension, arthritis, anxiety, obesity, diabetes, osteoporosis or back pain and other injuries that require attention.[59]

The Clinical Exercise Specialist is an advanced course that bridges the fitness community with the medical community. Individuals with pre-existing medical conditions can be referred by their physician, to a certified clinical exercise specialist, at Semper Fit, for an appropriate exercise program uniquely created for that individual. An exercise program developed for an asthmatic will be completely different from a program developed for an apparently healthy individual. Semper Fit has an agreement with BUMED wherein it states, "where appropriate and applicable a referral process shall be established between Semper Fit personnel and medical personnel."[60]

b. Dietitians

Dietitians are staffed by BUMED and augment every Marine Corps Base or main facility, which play an important role in nutrition and weight control. They offer classes in nutrition and weight management, healthy cooking, cholesterol, high blood pressure and hypertension, stress management, women and men's health, weight loss support group, diabetes, and health risk appraisals. Additionally they provide individually tailored weight control programs

59 Certified News, American Council on Exercise, www.acefitness.org, volume 6, number 4 July 2000.

60 Personal interview with Mrs. Catherine Ficadenti, Deputy Director Semper Fit Program Manager Fitness & Health Promotion HQMC (M&RA) Personal & Family Readiness Division Semper Fit Branch, October, 2003.

or dietary consultation and comprehensive nutrition education programs to achieve and maintain an optimal level of nutritional health and body composition. [61]

c. Personal Trainers

The Basic Fitness Course is a Personal Trainer course that provides training and certification for fitness personnel so that they may deliver appropriate fitness assessment and exercise prescription for active duty personnel and their families. Individuals working in Semper Fit fitness programs are required to be certified as personal trainers before they can work individually with clients. Personal trainers are qualified in fitness assessment that provides individuals with tests that measure cardio respiratory capacity, body composition, flexibility, muscular strength, and endurance. These fitness assessments are conducted according to protocols established by nationally recognized organizations, such as ACSM, NSCA, and ACE. Once a fitness assessment is given a personal trainer will provide an individualized exercise prescription that is tailored to the individual's specific condition or need. [62]

d. Fitness Director

All fitness directors hold a degree in Exercise Physiology, Exercise Science, or equivalency and must have five years experience within the health and fitness industry. They hold a current certification as fitness instructor and are CPR qualified. They are responsible for health promotion programs at each fitness installation and

61 Marine Corps Order P1700.29 Marine Corps Semper Fit program Manual, November, 1999.

62 Ibid.

must demonstrate professional competence in health promotions. [63]

3. Facilities and Capabilities

DoD Fitness Facility Standards are divided into four main categories; facilities, equipment, plans and programs, and staff. These combinations of MWR programs are available on an installation that collectively contributes to individual cardiovascular, strength and endurance, and flexibility conditioning. These standards were developed through a joint effort of all the Services, to include experts from the fitness industry and academia. [64]

Equipment requirements such as strength training and Cardiovascular are based on the overall installation population and the number of people that attend the fitness facility on a daily basis. Each facility should have a sufficient blend of cardiovascular equipment and percentage of total equipment to meet the needs of the customers. The following equipment and percentages are required per facility: upright bikes (16 percent), recumbent bikes (15 percent), rowing machines (5 percent), stair climbers (11 percent), treadmills (40 percent), and cross-trainers/elliptical machines (13 percent). [65]

4. RecTrac Management Information System

In 1995 Marine Corps MWR Strategic Plan approved the development, acquisition, and implementation of an automated RecTrac Management Information System (RMIS). The selection of RMIS provided a management information system that would automate recreation activities, provide a database of

63 Marine Corps Order P1700.29 Marine Corps Semper Fit program Manual, November, 1999.

64 Ibid.

65 Ibid.

> demographics for marketing purposes, increase customer service, provide usage data report capabilities required by DoD regulations, standardize data collection and reporting, improve service consistency, provide internal controls for inventory, and track sales history for retail/resale operations. Additionally specific to business operations, RecTrac reporting capabilities will be used to populate the profitability profile used by activity managers to assist with business management decisions, i.e. pricing of services and resale inventory as they relate to the management of expenses. Interface enhancements include automatic credit card and electronic check verification. RecTrac will fulfill the fitness/health promotion program requirements identified in the DoD Social Compact initiative to identify pathways to reach a healthy and fit force through surveillance efforts. Recreation goals identified in the DoD Social Compact identify the requirement for program managers to learn new skills to craft effective programming as well as new information processes to track the outcomes of their efforts. Marine Corps Community Service (MCCS) has adopted a standardized approach to automated data collection through the use of RecTrac and Activity Based Cost (ABC) Models. The data provided from these systems will assist MCCS in the justification of future funding. Deployment of the RecTrac system is scheduled for 19 Marine Corps installations. Currently, 12 of 19 Marine Corps installations have received RecTrac with an estimated completion date of FY04.

The RMIS system is a great tool that commanders and Semper Fit personal could use to track Marines in Remedial Physical Conditioning Program (RPCP). A Marine placed in RPCP would be required to sign into the system every training day to ensure participation in remedial PT. The instructor for the training session would upon class completion check off those RPCP Marines on a daily basis and Semper Fit staff would track individual progress on a

weekly basis into the RIMS database. Commanders would then get electronic reports on weekly or bi-weekly basis on the progress of RPCP Marines.

D. OTHER SERVICES HEALTH AND FITNESS PROGRAMS

The Department of Defense (DoD) has recently established a standard among the services for the determination of body composition.[66] This standard was established to provide consistency among the services in determining body composition. The procedures for this standard are to use the circumference tape method and the same formulas to determine an individual's percent of body fat.

> The reason DoD has gone to one validated equation for everyone is that it is not possible to determine which service's equation will work best, for any given individual without also having a criterion measure of body composition against which to compare. This is where the issue of "fairness" comes in. If the body composition estimation equation is changed, most individuals will still be classified correctly. However, the small sub-set of mis-predicted individuals will most likely change with different equations. All that is achieved is changing the individuals who are mis-predicted. This will not make estimations fair, it just changes whom it is unfair to. [67]

1. U.S. Air Force

As the Air Force Chief of Staff Gen. John P. Jumper states,

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[66] Department of Defense Instruction 1308.3 DoD "Physical Fitness and Body Fat Program Procedures," November, 5 2002.

67 Interview with Doctor, K. I. Kujawa, December, 2003, Naval Health Research Center, San Diego, CA.

> Our superb Total Force performance in Operations ENDURING FREEDOM and IRAQI FREEDOM secured our reputation as the greatest Air Force in the world. We should all take great pride in that. Our execution of the war plan was also consistent with our core values. Integrity, in that we upheld the highest standards of performance, learned from the things we could have done better, and will make ourselves better as a result. One aspect of our Total Force that does need improvement, however, is our physical fitness.[68]

General Jumper said he expects commanders around the service to follow his example and to participate in leading their airmen toward a more fit force. “I expect squadron commanders to be out in front of their squadrons, group commanders to be out in front of their groups, and wing commanders to be out in front of their wings as we go through this test cycle.” [69]

All members of the Air Force must be physically fit to support the Air Force mission. Health benefits from an active lifestyle will increase productivity, optimize health, and decrease absenteeism while maintaining a higher level of readiness. The goal of the Fitness Program (FP) is to motivate all members to participate in a year-round physical conditioning program that emphasizes total fitness, to include proper aerobic conditioning, strength/ flexibility training, and healthy eating. Commanders and supervisors must incorporate fitness into the AF culture to establish an environment for members to maintain physical fitness and health to meet expeditionary mission requirements and deliver a fit and ready force. The annual fitness assessment provides commanders with a tool to

68 Air Force Chief of Staff Gen. John P. Jumper, “Fit to Fight” Article, 30, July 2003, http://www.af.mil/bios/bio_5986.shtml.

69 Ibid.

assist in the determination of overall fitness of their military personnel.[70]

To maintain healthy lifestyles the Air Force has a fitness organization called the Health and Wellness Center (HAWC), which is part of the ongoing commitment of the Air Force to Provide “one stop” shopping for health, fitness, nutrition, and prevention and awareness programs. HAWC facilities improve readiness and productivity, and reduce health care costs for Air Force personnel. The HAWC is open to all active duty personnel, their dependents, military retirees, and DoD employees. [71]

The objective of health promotion is to encourage a healthful life-style in the community. Health promotion is a base-wide preventive medicine effort coordinated with medical oversight. The Health Promotion Program (HPP) consists of six basic elements: Tobacco use (prevention and cessation), physical fitness, nutrition programs, stress management, substance abuse prevention (drug and alcohol), and cancer/cardiovascular disease prevention. HAWC facilities offer the following classes: Cholesterol/ Hypertension (Healthy Heart), Diabetes Education, Weight and Body Fat Management Program, Stress Management, Tobacco Cessation, Monitored Fitness Courses, Fitness Assessments (TriFit), Sensible Way Nutritional Program, Nutritional Assessments, Running Clinic, and Health and Fitness Literature. [72]

All HAWC with a physically co-located staff will be composed of the following elements: one health promotion manager (HPM), one medical technician, one fitness program

70 Air force instruction 10-248, “Fitness Program” January, 2004.

71 Air force instruction 40-2, “Health and wellness Program” July, 2003.

72 Ibid.

trainer, one information manager, and an exercise physiologist. This staff will provide individuals with health and fitness assessments, lifestyle change programs, and a supportive environment to move each person toward a state of optimal health and fitness. [73]

2. U.S. Army

According to the Army, Physical fitness is the ability to function effectively in physical work, training, and other activities and still have enough energy left over to handle other contingences as they may arise. Therefore, all soldiers in the Active Army, Army National Guard, and Army Reserve must take the Army Physical Fitness Test (APFT) regardless of their age. The APFT is a three-event physical performance test used to assess muscular endurance and cardio respiratory fitness. It is a simple way to measure a soldier's ability to effectively move his or her body by using the major muscle groups and cardio respiratory system. Performance on the APFT is strongly linked to the soldier's fitness level and the ability to do fitness-related tasks. [74]

While the APFT testing is an important tool in determining the physical readiness of individual soldiers and units, it should not be the sole basis for the unit's physical fitness training. Commanders at every level must ensure that fitness training is designed to develop physical abilities in a balanced way, not just to help soldiers do well on the APFT. [75]

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73 Air force instruction 40-2, "Health and wellness Program" July, 2003.

74 FM21-20 U.S. "Army Physical Training Order," Headquarters Department of the Army, September, 1992.

75 Ibid.

A soldier’s level of physical fitness has a direct impact on his combat readiness. The many battles in which American troops have fought underscore the important role physical fitness plays on the battlefield. The renewed nationwide interest in fitness has been accompanied by many research studies on the effects of regular participation in sound physical fitness programs. The overwhelming conclusion is that such programs enhance a person’s quality of life, improve productivity, and bring about positive physical and mental changes. Not only are physically fit soldiers essential to the Army, they are also more likely to have enjoyable, productive lives. [76]

The Army’s physical fitness training program is divided into three phases: preparatory, conditioning, and maintenance. The starting phases for different units or individuals vary depending on their age, fitness levels, and previous physical activity. Young, healthy persons may be able to start with the conditioning phase, while those who have been exercising regularly may already be in the maintenance phase. Factors such as extended field training, leave time, and illness can cause soldiers to drop from maintenance to a conditioning phase. [77]

In addition to exercise, proper nutrition plays a major role in attaining and maintaining total fitness. Good dietary habits greatly enhance the ability of soldiers to perform at their maximum potential. A good diet alone, however, will not make up for poor health and exercise habits. Therefore, commanders and supervisors will monitor all members of their command (officers, warrant officers,

76 FM21-20 U.S. “Army Physical Training Order,” Headquarters Department of the Army, September, 1992.

77 Ibid.

and enlisted personnel) to insure that they maintain proper weight, body composition, and personal appearance. At minimum, personnel will be weighed when they take the Army Physical Fitness Test (APFT) or at least every six months. Personnel exceeding the Army's weight table or identified by the commander or supervisor for a special evaluation will have a determination made of percent body fat. Maximum allowable percent body fat standards are 20 percent body fat for males and 26 percent body fat for females. This percentage is based on age. As age increases the max allowable percentage of fat will increase. [78]

Commanders and supervisors will provide educational and other motivational programs to encourage personnel to attain and maintain proper weight (body fat) standards. Such programs will include, nutrition and education sessions, cardiovascular training, circuit training and exercise with free weights conducted by qualified health care personnel at the Army's fitness centers. [79]

3. U.S. Navy

Physical fitness is a crucial element of mission performance and must be a part of every Navy member's life. Mission readiness and operational effectiveness are built on the physical fitness of the individual; therefore, all Navy personnel shall maintain personal physical fitness by regular exercise and proper nutrition. The principal goal of the Physical Readiness Program is to create a culture of fitness to enhance a member's ability to complete tasks that support the command's mission. Commanding Officers

78 Army regulation 600-9, U.S. "Army Weight Control Program," Headquarters Department of the Army June 1987.

79 Ibid.

shall aggressively integrate physical readiness activities into the workweek in the same manner applied to meeting other mission and operational requirements. [80]

Based on scientific research the National Institute of Health (NIH) conference, defined obesity as the amount of body fat associated with significant detrimental health effects. This corresponded to a weight-for-height 20 percent above the midpoint weight for a medium-frame individual, based on the 1983 Metropolitan Life Insurance Height-Weight Tables. The Naval Health Research Center (NHRC) scientists reviewed this and numerous other scientific studies and recommended the NIH definition of obesity as the upper limits for Navy standards. Since DOD prescribes body fat percentage as the measure of body composition, NHRC recommended upper allowable Navy limits to correspond to 22 percent for men and 33 percent for women ages 17 to 39 and 23 percent men and 34 percent for women over 40. Most members should have a significantly lower level of body fat than the upper allowable Navy limits. [81] Those who fail to meet the fat standard are placed in the Body Composition Assessment (BCA) program. BCA is the maximum weight for height screening and body fat percentage estimation based on circumference measurements.

According to the OPNAVINST 6110.G, commands must develop and implement a Fitness Enhancement Program (FEP) that meets the needs of all naval personnel striving for improved fitness, not simply those who do not meet standards. FEP must be designed to increase and maintain cardio-respiratory fitness, muscular strength and endurance, flexibility, reduce excess body fat, promote

80 OPNAVINST 6110.G, Navy "Physical Readiness Program Manual," October, 2002.

81 Ibid.

year-round fitness and health, and provide nutritional guidance. Activities shall ensure all medically qualified personnel meet or surpass all physical readiness standards. Testing the physical fitness and readiness of every uniformed member of the Navy is required. Physical Fitness Assessment (PFA) includes Body Composition Assessment (BCA) and Physical Readiness Test (PRT).[82]

Members who seek to achieve optimum physical fitness to develop a healthy lifestyle or to meet Physical Readiness Program standards have a variety of command and Navy sponsored programs at their disposal. Command Fitness Leader (CFL), ShipShape, Morale Welfare and Recreation (MWR) facilities, and fitness professionals can aid in structuring an individuals Fitness Enhancement Program to produce the greatest benefit. [83]

The Navy's ShipShape program is a BUMED approved weight management program, offered by the medical department, and designed to provide personnel with basic knowledge of nutrition and effective techniques for healthy eating. Attendance is not mandatory however, it is open to personnel who exceed or are in danger of exceeding BCA standards. Personnel in the BCA program shall be assessed regularly, at a minimum, on a monthly basis. Additionally they shall receive appropriate support and access to MWR, medical department, and other organization facilities and staff to meet standards. [84]

The ShipShape Program is coordinated by the Health Promotion Department at the local Navy Medical Treatment Facilities (MTFs). The program was developed and made

82 OPNAVINST 6110.G, Navy "Physical Readiness Program Manual," October, 2002.

83 Ibid.

84 Ibid.

available at the local MTF level to increase accessibility of a weight management program for Active Duty Sailors and Marines needing assistance in maintaining Physical Readiness Standards. ShipShape Coordinators are strongly encouraged to develop their programs as a joint effort with the MTF Nutrition Divisions, Psychology, and Physical Therapy Departments. Additionally, the Coordinator is encouraged to develop a cooperative effort with the staff at the local MWR Fitness Facilities, to incorporate the expertise of the local exercise and fitness staff into the program.

ShipShape is designed to provide active-duty personnel with basic information regarding nutrition, stress management, exercise, and behavior modification techniques to lower and maintain an acceptable body weight and Body Fat percent that is within Navy Standards.[85] Its goal is to increase the number of active duty personnel who are living a healthy lifestyle and maintaining a healthy body composition. The program consists of eight sessions, each conducted by the program facilitator and/or a subject matter expert, if appropriate. The sessions are planned consecutively, with each session following up on the previous session, before the new topic for the week is introduced. The skills development becomes more complex as the program progresses and the comfort level of the group increases. Each session is briefly described below: [86]

Session 1: Orientation

Ship Shape is designed for individuals who are in the Preparation or Action Phase of the Stages of Change Model.

85 http://www-nehc.med.navy.mil/hp/shipshape/

86 Ibid.

This session focuses on helping the participants decide if they are ready to begin making behavior changes toward a healthier lifestyle. Participants complete the Weight Loss Readiness Test and also determine what stage of change they are in. Guidelines for successful weight loss and maintenance are discussed. Those individuals who feel they are ready to begin the program complete the program registration process. Weight management information is given to those individuals who choose not to register for a program.

Session 2: Guidelines for Success

This session focuses on the importance of setting healthy, realistic short and long-term goals. Weight management nutrition guidelines are included in this session.

Session 3: Nutrition Facts and Fallacies

There is no “magic pill” when it comes to healthy weight loss and maintenance. Diet fads and current diet medications are discussed. Participants design a healthy eating plan for themselves, based upon their current weight, desired weekly weight loss goals, and the Food Guide Pyramid.

Session 4: Move Your Body

The importance of exercise with regards to weight management is discussed, including exercise guidelines to follow to lose body fat and gain lean muscle tissue. Tips to motivate and handle obstacles to exercising are also discussed.

Session 5: Making Healthy Choices

This session focuses on strategies for fitting healthy eating into a busy lifestyle. Topics include: ingredient

substitutions, recipe modification, and tips for shopping and eating out

Session 6: Building Your Support Team & Listening to Your Body's Language

Participants are assisted in identifying their supporters, how to ask for support, how to handle non-support and the importance of body image and self-esteem in weight management success. Behavior modification is introduced as the third key ingredient in a weight management program. This session focuses on physical hunger. The concept of “Conscious Eating” is introduced as a key tool in satisfying physical hunger.

Session 7: Stress Management & Emotional Eating

This session continues the discussion from session 6, this time focusing on emotional eating. The ABCs of behavior chains are introduced, along with a discussion of techniques that can be used to break the chains to emotional eating. Does stress cause one to eat or does eating cause stress? This question begins the discussion for this session, which focuses on identifying sources of stressors, signs of stress, and stress management tools that can be used to handle stress, instead of food.

Session 8: Long-term Success

In this final session of the program, lapse, and relapse are defined. Strategies to handle lapse and relapse are discussed and tips are given for continued weight loss and weight maintenance. Opportunities for follow-up are discussed. The program evaluation is conducted, including the final weigh-in, the Post-test, repeat of the Weight Loss Readiness Test and the Program Evaluation Form.

As one can see the target for this program is active duty personnel at body fat ranges that are above Navy

standards. By the new instruction, all active duty personnel are eligible to attend however; the program is not mandatory for anyone. Also, the first option for individuals who are “Borderline” is the command Fitness Enhancement Program (FEP) and the self-study guide for weight management. People who offer support (a spouse, close friend, or relative) should be welcomed to attend sessions with active duty participants. This strategy is often used to increase participation and motivation.

Body mass index is also added to the assessment process. Body mass index indicates whether or not a person is at the proper weight for height. Keep in mind that if an individual is extremely muscular they maybe mistakenly classified as overweight or obese. The next iteration of ShipShape will use the body mass index as a screening mechanism to place members in a higher level of intervention.[87]

E. CHAPTER SUMMARY

Marines taking care of Marines have long been a hallmark of the Corps. A multitude of programs offered through Semper Fit support this concept and sends a clear message to Marines that the Corps’ cares. Semper Fit is also a reliable and vital tool for Marine leaders to use to help maintain the most dedicated, capable and professional military fighting force in the world. As the Marine Corps leader in healthy lifestyle programs, Semper Fit can set the direction into the 21st Century, continuing to “Reach Forward” by developing new programs, that support today’s

87 http://www-nehc.med.navy.mil/hp/shipshape/

needs, and establish partnerships that reflect the needs and expectations of our Marines and their families. [88]

Semper Fit cares about the wellness of the Corps and demonstrates its willingness to extend this care with numerous programs designed to support missions. With a program expansion, to include assistance for the remediation of Marines placed in BCP/RPCP Semper Fit would alleviate the burden of individual units training RPCP Marines. The introduction of such a program would increase consistency within RPCP therefore lessoning the time a Marine takes to return to readiness. This would cause a decrease in unnecessary injuries compounded by overtraining through injury awareness, leading to the reduction in the incidence of aggravated injuries. Training would be administered by Semper Fit professionals rather than individual Marine units and tracked by the RIMS system. Adopting the Navy's ShipShape program as a model RPCP Marines would attend a separate stepwise course tailored to their specific injuries.

The ultimate goal of Semper Fit Health Promotion is to create an atmosphere within the Marine Corps that contributes to total health and optimal readiness in achieving this goal. All Marines must understand the importance of a healthy lifestyle. This goal is attainable through proper education and training.[89] Policy makers must realize the importance Semper Fit plays in overall mission readiness

88 Marine Corps Order P1700.29 Marine Corps Semper Fit program Manual, November, 1999.

89 Ibid.

IV. REMEDIAL PHYSICAL FITNESS PROGRAM

A. OVERVIEW

According to the current Marine Corps Order (MCO) 6100.12, Marine Corps Physical Fitness Test and Body Composition Program Manual (MCPFTBCP)

> It is essential that every Marine maintain the established standards of health and physical fitness. With age, it is not uncommon for the average Marine to experience a decrease in physical activity, a change in metabolic rate, with unchanged caloric intake. As a result, body fat and weight may increase, having a negative impact on one's health and level of fitness. Medical authorities state that excess body fat can be associated with high blood pressure, high blood cholesterol, diabetes, cancer, cardiovascular disease, and similar health risks. In extreme climates and physically demanding environments, excess weight and body fat can also impede physical performance and stamina, which is of particular importance to the Marine and the mission. Therefore, Marines that fail to meet these requirements are placed in the Remedial Physical Conditioning Program (RPCP) for a minimum of six weeks.[90]

The Body Composition Evaluation is a semi-annual Headquarter Marine Corps (HQMC) requirement designed to ensure Marines are within Department of Defense (DoD) established height/weight or body fat standards. The intent of the RPCP is not punitive in nature, but designed to encourage improvement in overall fitness and body composition. Unit leaders and Command Physical Training Representatives should assist Marines in clearly identifying their deficiencies, developing specific strategies to improve, and track progress. The RPCP should focus on

90 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

realistic goal setting, healthy life styling strategies, progressive PT, dietary measures, and testing and evaluation. The RPCP should be challenging, employ a cross-training philosophy, and ensure physical measures of safety are taken into consideration to avoid over-training and potential overuse injuries.[91]

B. REQUIREMENTS

The Corps requires every Marine to be within the height (inches) and weight (pounds) standards as defined in the MCPFTBCP. Those that do not meet the standard must be evaluated for body fat composition using the circumference tape method mentioned in chapter two.

> The Marine Corps' weight and body fat standards are health and performance based, and not based on appearance. Marines are considered not within these standards when their body weight and body fat exceed the maximum limits as contained in the MCPFTBCP. When a Marine's percent body fat exceeds the maximum limit (18% for males, 26% for females), then he or she will be evaluated in physical performance (e.g., current semi-annual Physical Fitness Test (PFT)). If the Marine does not meet the Physical Performance Evaluation criteria, then the CO will have the Marine evaluated by a Medical Officer (MO) and assigned to a Body Composition Program (BCP). Marines assigned to the BCP will receive command assistance in reducing body weight and in particular body fat, in order to attain and maintain a more healthy physical fitness state.[92]

Those Marines who attain a first class PFT and are 22 percent (30 percent for females) body fat or less are

91 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

92 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

exempt from the program. Those who fail to achieve a first class PFT are placed in RPCP.

Prior to being placed in the RPCP Marines must be evaluated by a medical officer. The Medical Officer (MO) is responsible to evaluate the Marine's body composition, overall health, diet, and physical ability to participate in the BCP and RPCP. The following conditions will be evaluated by the MO to determine if there is an underlying conflict with being placed in RPCP.[93]

1. Determination of whether the weight or body fat increase is due to an underlying cause or associated disease.

2. The Marine's current duty status (e.g., full, light, or limited duty).

3. The recommended dietary plan, and weight/body fat reduction goals.

4. The physical conditioning restrictions and or limitations imposed.

5. The date the Marine is expected to return to full duty status.

6. Any other pertinent information that pertains to the Marine's individual case.

The objectives of the Marine Corps' BCP are:

1. To establish healthy weight and body fat standards that ensure all Marines are physically capable to perform their duties.

2. To contribute to the health and well being of every Marine by continuously monitoring weight, body fat, diet/nutrition, and physical fitness conditioning.

3. To motivate all Marines to set the example by maintaining the established body composition standards.

93 Ibid.

4. To ensure those Marines who do not meet established standards are counseled accordingly, and given the opportunity and proper guidance to achieve the standards through the BCP and RPCP.

It is every Marine's responsibility to maintain the Marine Corps' body composition standards, or if not in adherence with standards, to take appropriate action to return to readiness in a timely manner. Marines on light or limited duty, whose medical condition precludes them from participating in specific activities, will be expected to participate in conditioning alternatives and dietary adjustments, in order to maintain these standards.

The Marine Corps offers educational programs, events, and other motivational means to encourage Marines to achieve and maintain appropriate body composition standards. Such programs could include, but are not limited to: body composition seminars, health and fitness fairs, and individual consultations conducted by qualified dieticians/nutritionists, medical authorities, and Semper Fit personnel.[94]

Once a Marine has all Program Endorsements, medical documentation, counseling, body composition testing results, and a training log has been established he or she will be placed in the RPCP. Units are then required to conduct diet and nutrition classes for all RPCP Marines or set up appointments with the fitness and medical professionals at the local Semper Fit facilities. A Marine Corps Institute (MCI) Course 3316, "Basic Nutrition," for that Marine (whether Officer or Enlisted), will be ordered. This MCI will assist the Marine for a quick return-to-readiness. This MCI must be completed within the six-month

94 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

assignment period and prior to BCP assignment expiration. A Marine in a light or limited duty status will be required to participate in an alternative RPCP, based on the physical restrictions and limitations imposed by the MO.[95]

A Marine making satisfactory progress[96] and who is reasonably close to meeting their weight and body fat standards at the end of the first six month BCP assignment may be granted a Program extension. A Marine not making satisfactory progress during the first assignment will be processed for administrative separation. Also any Marine who has been assigned to and officially removed from the BCP at any time in their career, and fails to meet the weight and body fat standards a second time, may also receive a one-time second assignment to the BCP (and RPCP). On a second assignment, Marines will be given six months with no extensions to conform to standards. If the Marine fails to make the standard after the second six-month period he or she will be processed for administrative separation. [97]

C. RETURN TO READINESS

Units that have Marines on RPCP suffer from personnel deficiencies, which must be addressed and remedied. Marines in RPCP degrade a unit's personnel readiness which impacts mission readiness, vital to overall mission accomplishment. The process of returning a Marine to full readiness status is both the responsibility of the Marine Corps and the

95 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

96 Satisfactory progress is tracked by the recommendations of the Medical Officer (MO). If a Marine is recommended by the MO to lose 2 pounds in a week and fails to do so then unsatisfactory progress is made. However, if the Marine loses 1 pound the first week and 3 the next then the final evaluation will be determined by the Commanding Officer (CO). There is no set guideline for the CO to follow it is up to their discretion.

97 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

individual Marine. The question remains how to most quickly and efficiently return RPCP Marines to full readiness.

The "Return to Readiness Program" which is being piloted at Marine Corps Base (MCB) Camp Lejeune and soon to be implemented at Quantico is an excellent example of the positive partnering between Semper Fit and the regional medical treatment facility to ensure those Marines on light/limited duty and remedial programs return to full duty, fit and deployable. The overarching program goal, of preventing injuries and returning active duty Marines to full duty sooner, resulting in a decrease in lost man-hours, is on target. Sports medicine/athletic training practices, such as the programs at Camp Lejeune and MCB Quantico offer a solid partnering model to be further developed. [98]

However, these initiatives require institutional pedagogical change for long-term success. One such change is getting our Navy Medical personnel to view and treat Marines like highly conditioned athletes vice "ordinary patients." Simply stated, Marines are anything but ordinary patients, therefore, they should be treated similar to the way a professional athletic trainer treats his players, with the end-state being returning back to the sport/game as quickly as possible. A draft Memorandum of Agreement (MOA) between Headquarters Marine Corps and the Bureau of Medicine (BUMED) has been written with the major scope of the agreement, committing HQMC and BUMED to support and sustain health promotion/prevention

98 Personal interview with Mrs. Catherine Ficadenti, Deputy Director Semper Fit Program Manager Fitness & Health Promotion HQMC (M&RA) Personal & Family Readiness Division Semper Fit Branch, October, 2003.

initiatives. “Reaching Forward” with this agreement is the right, first step.[99]

Maintaining a high quality, Semper Fit staffs ensure their personnel are viewed by Marine Corps leaders as their “special staff officers” in caring for their Marines. In an effort to bridge the gap between the medical and fitness fields, the American Council on Exercise (ACE) brought together the nation’s top health/fitness specialists to develop a new advanced certification that certifies skilled fitness professionals to step in where traditional healthcare leaves off. The Semper Fit advanced fitness course, titled the “Clinical Exercise Specialist” is a national certification offered in many locations throughout the country. This training provides Semper Fit personnel with the credentials and competencies necessary to partner with Navy Medicine to assist individual Marines and family members recovering from various debilitating illnesses and injuries. This training is part of building Semper Fit to improve readiness in the recovery of operational Marines who are fit and ready.[100]

The Marine Corps has also developed guidelines or “tools” in the MCPFTBCP to assist unit commanders to return Marines to readiness. These tools are recommended procedures for commanders to use in developing their own program for conducting remedial PT. It is the discretion of individual units on how to best implement their programs based on recommendations from the MO and Semper Fit professionals. The Semper fit staff consists of personal

99 Personal interview with Mrs. Catherine Ficadenti, Deputy Director Semper Fit Program Manager Fitness & Health Promotion HQMC (M&RA) Personal & Family Readiness Division Semper Fit Branch, October, 2003.

100 Marine Corps Order P1700.29 Marine Corps Semper Fit program Manual, November, 1999.

trainers and dieticians /nutritionists, and individual Marines within the command.

Remedial physical conditioning is a process by which Marines are conditioned in a progressive manner to meet prescribed physical fitness and body composition standards. The RPCP goal is to provide challenging conditioning sessions, using the spectrum of aerobic conditioning, resistance conditioning, and other related exercises that afford Marines an opportunity to rebuild themselves after a weight or body fat increase, injury/illness, pregnancy, or a period that lacked a structured fitness program.[101]

Participation in the RPCP is a mandatory requirement for Marines who fail the Physical Fitness Test (PFT) or who are assigned to the Body Composition Program (BCP). Marines will also be assigned to the RPCP when they consistently display problems in MOS-specific tasks, (e.g., conditioning marches, etc.) or struggle to meet the minimum standard for an event during a semi-annual PFT. Performance on unit formation runs will not be used as RPCP entry/exit criteria. Marines recovering from injuries or prolonged illness may be screened by the RPCP for beneficial effects. In the later case, commands must take into account any follow-up medical care (therapy) requirement and tailor the RPCP to accommodate those physical limitations or restrictions imposed by the Medical Officer (MO). Deficiencies, which can be improved or corrected by a command-directed remedial conditioning program, fall into several categories:

1. Lack of strength in one or more body parts.

2. Lack of overall cardiovascular or muscular endurance.

3. Lack of adherence to body composition standards.

4. Lack of mobility (posture, balance, stability, agility, coordination, power, speed and flexibility).

5. Lack of motivation and dedication.

101 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

6. Lack of education and experience in health and fitness.

The structure and examples given in MCPFTBCP have several types of programs that units can employ to aid commanders with their RPCP. These examples have a wide range of training that specifically targets certain types of deficiencies. They range from specific PT events, such as conditioning marches or team sports. For example, a group that exhibits a deficiency in upper body strength would execute a program that includes pull-ups, rope climbing, rifle PT, log drills, and weight training. A second group may exhibit deficiencies in cardiovascular respiratory endurance, and therefore would execute a program that includes individual and ability group running, grass drills, circuit training, and fartlek running.[102]

D. CHAPTER SUMMARY

The MCPFTBCP details several examples how unit commanders can help a Marine. However, not every example fits all RPCP Marines and consistency in administrating is essential. Returning Marines to full readiness is the responsibility of his or her command. This responsibility is typically directed by the CO to the S-3 Operations Department to develop a command structured program for RPCP Marines. Marines selected to conduct the RPCP are typically strong in PT however, they are not personal trainers and may not understand the best way to help a RPCP Marine return to full readiness. The program that the command chooses will also vary between other commands. A Marine being transferred to a different command may experience a

102 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

completely different way to conduct RPCP. In the following chapter Marines that have been placed on RPCP have openly stated psychological stress and perceived inconsistencies within the program. The reason for these inconsistencies between commands programs could be caused by how the RPCP is administered. Does the program best fit the RPCP Marine or the command administering it? This inconsistency could be alleviated with improved programs that better assist commands in returning RPCP Marines to full readiness. These programs could include, Semper Fit professional trainers teaching RPCP Marines in a variety of different classes, in cardiovascular and weight training, tailored to the individual Marines needs. Then, when working directly with physical therapists and clinical exercise specialists, commanders would have a more consistent program.

Another consideration would be to have Semper Fit run the RPCP program. Marines could report to one of many tailored fitness classes conducted on a daily basis. RPCP Marines could choose a morning, afternoon, or evening class four days a week. These tailored fitness programs would target different areas of fitness during each class. This would minimize the inconsistency among different commands. Units that are not affiliated with a Semper Fit facility would then be required to stick with the status quo of command structured RPCP.

V. INTERVIEW ANALYSIS

A. BACKGROUND

To gather possible psychological effects regarding Marines in the Remedial Physical Conditioning Program (RPCP), personal data was collected from Marines in different occupations across the Marine Corps. Unfortunately because of time and the fact that this thesis is non-funded, it was not possible to obtain a stratified sample. Due to the lack of travel funds a Marine detachment with the Defense Language Institute located in Monterey, California, and one at headquarters and service battalion at Quantico, Virginia were selected.

B. SCOPE

1. Methodology of Commands Interviewed

The Marines interviewed were from Headquarters and Service Battalion at Quantico, Virginia and the Defense Language Institute (DLI) at Monterey, California. Two different units were selected to get a spectrum of Marines from across the Corps. The following units from Headquarters and Service Battalion were selected: Headquarters Company, Service Company, Operations Company, TACO Company, and TECO Company. From DLI, the Marine Detachment was selected. Except for leaders, all interviewed Marines were on one of the following programs: Body Composition Program (BCP), Remedial Physical Conditioning Program (RPCP), or physical rehabilitation. All Marines on rehabilitation were also in the BCP or the RPCP. Four of the Marines at DLI were not officially in

RPCP, they fell out of a unit run and were temporarily placed in RPCP for 30 days. The names of Marines and the unit they belong to were taken out and referred to as interviewees for individual and unit protection.

2. Conducting the Interview

The interviews were conducted in the main conference room at H&S Battalion and the DLI Marine Detachment. Each group of Marines was explained the nature and background of the interviewer as an enlisted Marine, and the scope of the interview research. The intent was to provide an open comfortable atmosphere to get to the heart of the issues. Each Marine was informed that this interview was confidential and at no time would their name be released or their command be informed of their answers. Interviewees were told that at any time they felt uncomfortable about a question they would not be obligated to answer. An open atmosphere would be vital to accurate information. The interview proceeded with a one-on-one approach so personal individual answers would not be influenced by peers.

3. Personal Individual Answers

The scope of the interview questions was directed in three different areas. Each Marine was asked 22 questions (see appendix a), which took approximately 30 minutes per interview. Standard variables such as name, rank, unit, gender, age, Marine Occupational Specialty (MOS), marital status, number of children, last unit, last deployment date, type of program (e.g. RPCP, BCP, or physical rehabilitation), and years in service established the demographics. Out of the 21 interviewees, five were planning on re-enlisting. When asked why they would not re-enlist, answers ranged from “Marines missing home, the

Marine Corps was not what they expected, not their lifestyle, ready to move on, not having fun anymore, and people now judge me for how I look not how I perform." Other repeated comments about ability were discussed such as, "the Marine Corps is based more on physical ability than mental ability. How can I go from outstanding proficiency (4.7) and conduct (4.7)[103] for promotion to below average (4.2) and (4.0) once put on weight control, when my job performance has not changed?"[104] This is the correct action taken according to MCO 6100.12, paragraph 3200, and states E-5 and above who are assigned to the BCP and/or fail to meet the body composition standards at completion of a BCP assignment will be administered an adverse Fitness Report. E-4 and below will receive proportionately lower proficiency and conduct marks then non RPCP Marines.

Another question asked of the interviewees was if they felt the current method of fat measurement was accurate. The split was 50/50: half did not know the accuracy of the circumference tape measurement, and the other half had problems with it. Two Marines commented on how they "felt uncomfortable with being measured by another Marine, plus of a biased factor from different Marines doing the measuring." Another felt "it did not truly represent the proper fat percentage because of their ethnicity or race."

When asked if they would prefer another method of measurement, such as the skinfold method. Several Marines stated, "I would feel more comfortable, it would cover my entire body." Others felt it was more accurate than the

103 Twice a year E-4 and below are given proficiency and conduct points for their composite score for promotion.

104 Personal interview conducted at H&S Battalion, September, 2003.

current Marine Corps method. After I finished writing down their responses, Each Marine was then informed that there was no difference in accuracy between the two methods of measurements; they both have a greater than three percent error, and the regression models were derived from the same criterion measure. Most respondents replied: “I still would like to see where the fat is so I can see the inches change as I loose the fat.” Another said: “Then, why do I get a large difference from both methods?” This response was not uncommon. As stated earlier in chapter two (body composition methods), the circumference and skinfolds methods will report different results for the same individual. Therefore, one would get a different reading between measurements.

The next question asked was not stated on the interview sheet however; the question came to mind during the interviews. When asked if they felt isolated by peers and treated differently by superiors, one Marine commented on how she felt rejected from her peers and singled out as “not motivated” from superiors. Another Marine stated: “I saw a lack of concern with superiors not looking out for my best interest. My peers began to push me away, and I felt isolated.” Another interviewee stated, “I feel psychological stresses from other Marines in my shop, however, I know once I lose the weight things will return to normal.”[105]

The final group of questions asked had to deal with “Semper Fit” and the current BCP and RPCP. Marines were first asked what they thought of the remedial program they were in and if it helped them to return to standards. Many interviewees commented on the differences between RPCP

105 Personal interview conducted at H&S Battalion, September, 2003.

Marines, where it was apparent that not everyone in the program needed the same attention. Many Marines that were interviewed agreed there needed to be separate individual attention given to the RPCP Marine and not one program would work for everyone. A primary concern of the interviewees was that Marines were not given adequate help in nutrition, health, or fitness however; they were expected to "get with the program," or they would be administratively processed for separation. The employment of Semper Fit resources to assist in the execution of the RPCP and BCP could be an asset in assuring the Marine has the best opportunity to return to readiness. Semper Fit Fitness Centers are staffed by qualified professionals, and the Semper Fit website (www.usmc-mccs.org) provides expert guidance in the areas listed below. The fitness centers, available at most major Marine Corps installations, can provide the following services:

a. Fitness assessments and exercise prescriptions.

b. Exercise orientation.

c. Group exercise opportunities.

d. Instructional skill development.

e. Health promotion programs.[106]

Almost all the interviewed Marines at H&S Battalion were aware that programs existed within Semper Fit to help them to return to readiness however, several were unsure how to seek this assistance or not afforded the time to do so.[107] All the Marines at DLI detachment were unaware that Semper Fit even existed. Part of that is understandable because these Marines are fresh out of Boot Camp and on an

106 Marine Corps Order (MCO) 6100.12 MARINE CORPS PHYSICAL FITNESS TEST AND BODY COMPOSITION PROGRAM MANUAL (SHORT TITLE: MCPFTBCP), May, 2002.

107 Personal interview conducted at H&S Battalion, September, 2003.

Army installation that lacks a structured health and fitness center. [108]

As a former PFT coordinator at an aviation squadron, Marines currently in the RPCP stressed concerns with the lack of professional assistance.[109] They commented how the RPCP mainly consisted of running steep hills. Several of them had knee problems and felt tremendous pain during the entire run. To tailor a different program, the command implemented a slightly different approach where the RPCP Marines would run three days a week and the other days they would weight and or cardio-train at the Semper Fit centers with low impact conditioning. This was not true with the Marines interviewees at DLI. The DLI detachment was running eight times in a five-day period. Three times a week they were running twice a day on steep hills. One Marine was put on the program for 30 days from dropping out of a run because of a bad knee. This Marine ended up running on it up to eight times in a week during the 30-day period. The program only aggravated the Marines knees more making it extremely painful and difficult to participate. Interviewees also commented on the lack of professional assistance with diet and fitness. The DLI detachment was however, fortunate enough to have an S-3 representative that was formerly a personal trainer. This Marine was used to help develop diet plans for the BCP Marines. When asked what they thought of the current RPCP they were in the Marines stated comments such as, “I need more help with my diet not from another Marine just because he is a personal trainer but from someone that is a qualified dietitian, to

108 Personal interview conducted at the DLI Detachment, January, 2004.

109 Personal experiences as a PFT coordinator Officer in Charge (OIC) in charge of running the RPCP.

multiple comments on how the program is not consistent or tailored to individual needs with changes occurring on a monthly basis." [110]

On the other hand at H&S battalion, they were concerned about not having enough time to run or run long enough. The unit did break up the program where different days worked all combinations of fitness such as cardio, weight lifting, and wind sprints. One commander responsible for his RPCP Marines commented on how the program was not standard across the Marine Corps. He said: "I would like to PT every work day by increasing the amount of running, and tailor the program to the Marines individual needs. Some Marines need to run and work just cardio, some need to strength build, and others need to swim because of medical hold status. The problem is I do not have the man power to monitor all of them all the time."[111] When asked what if Semper Fit had a program set up three times a day before work, during lunch, and after work, where his Marines could go to remedial training without costing him one single person in manpower. Also, what if the Marine Corps made it mandatory for all Marines put on the program to attend a class in nutrition, enroll in a fitness and nutrition MCI,[112] and get a personal evaluation from a fitness trainer? His answer was, "That would be the best of both worlds. We need that assistance from the professionals at Semper Fit. The system that is in place has so much potential in helping units with overweight or injured

110 Personal interview conducted at the DLI Detachment, January, 2004.

111 Personal interview conducted at H&S Battalion, September, 2003.

112 This is a new under construction MCI that is specifically tailored in health, fitness, and nutrition. It takes about 30 hours to complete with a 150 question test.

Marines." [113] When asking the same question to the Marines on the program, every one of them was in favor of attending some type of nutrition class, meeting with a personal trainer, and being enrolled into a program tailored to their condition. In fact, some interviewees that were self-motivated had gone to see a personal trainer on their own to be given a strength and stress test for fitness.[114]

C. RETENTION ANALYSIS

> Annually, the Marine Corps separates an average of over 7,000 Marines because of physical disability or misconduct. Together, separations from abuse of alcohol and weight control average an additional 789 Marines per year. On average, another 108 Marines die per year, most because of motor vehicle accidents, and one out of four take their own life. In all, almost 8,000 Marines per year are lost due to death, physical disability, misconduct, alcohol, medical retirement, and weight control. The estimated dollar value for these losses (annually) is roughly $983 million. The manpower burden is equivalent to two infantry regiments. The Health Promotion goal is to continuously improve the use of, and trends in, healthy lifestyles and behaviors as reported by the DoD Survey of Health Related Behaviors Among Military Personnel, the primary indicator of health trends in the Marine Corps. This will reduce the attrition statistics shown above.[115]

From 1997 to 2004 the Marines Corps discharged an average of 49,000 Marines. The cause of discharges ranged from honorable, general, bad conduct, to dishonorable. For the purposes of this thesis, it was important to know on

113 Personal interview conducted at H&S Battalion, September, 2003.

114 A personal trainer will asses your overall fitness condition with several tests, such as a fat test with skinfold calipers, a test for blood presure, a strength test, and a flexibility test. Then they can recommend the proper type of fitness training you will need and demonstrate how to properly use the equipment.

115 Semper Fit Fitness and Health Promotion, January, 2004 http://www.usmc-mccs.org/SemperFit/fithlth/top

average how many Marines per year were discharged for weight out of the total population of discharged Marines. The emphasis is on the total number of overweight Marines discharged and unable to re-enlist before their contract was complete, or at contract completion. Data gathered from 1997 to 2002 from the Defense Management Data Center (DMDC) was used to determine Marines discharged during the year for weight.

In fiscal years (FY) 1997 to 2002 the Marine Corps discharged between 51,768 to 48,808 Marines annually.[116] Total Marines discharged for failure to meet weight standards in FY1997, were (209) FY1998, (171) FY1999, (139) FY2000 and FY2001, (87) and in FY2002, (38) were discharged. The population of Marines discharged overall in FY1997, were (51,768) FY1998, (49,573) FY1999, (47,183) FY2000 (46,428), FY2001, (46,867), and in FY2002, (48,808). The overall weight discharge percentage was then calculated per year. Although these numbers seem small, they however, do not include Marines discharged for medical conditions who were also on BCP/RPCP or Marines that were successfully removed from the program and had chose not to re-enlist. DMDC's data had no variable to distinguish a medical discharge with someone who was also overweight because of the precedence the medical code received. Additionally, Marines that were removed from RPCP may not have been able to re-enlist due to MOS unavailability (boat spaces) or poor fitness reports. (Refer to figure 1).

[116] Data received from Defense Management Data Center for discharges of Marines from 1997 to 2002.

1997 to 2002 Marines discharged for weight						
Data Year	DMDC Pop	DMDC Weight	DMDC Percent	TFDW Weight	Lowest MOS	Highest MOS
1997	51768	209	0.404%	216	NA	NA
1998	49573	171	0.345%	180	NA	NA
1999	47183	139	0.295%	145	NA	NA
2000	46428	87	0.187%	105	O300	5000
2001	46867	87	0.186%	95	O300	4000
2002	48808	38	0.078%	73	O300	2000
2003	NA	NA	NA	47	NA	NA
2004	NA	NA	NA	10	NA	NA

Figure 1. Marines discharged for weight[117]

To determine the individual discharges by Military Occupational Specialty (MOS) variable categories were grouped into general sections. For example, a Marine who was a 0311 (rifelmen), 0331 (machinegunner), and 0341 (mortarmen) MOS were classified as 0300 infantry category. All 6000 MOS's fell under the aviation community ranging from Aircraft mechanic to weather forecaster. All 0100's were in an administrative billet.[118] The Marines were then broken out by percentages discharged for weight across the different MOS fields. The resulting numbers were then used to determine the lowest percentage of Marines being discharged and classified as overweight, then questions or assumptions as to why could be analyzed. The entering assumption was that Marines whose daily job requires a high level of physical activity would have a lower percentage of Marines placed in RPCP. This was found to be true in the infantry field for FY2000 to FY2002. The MOS 0300 had the lowest percentage of Marines discharged for weight. The data received for 1997 to 1999 had unusable information

[117] Data received from Defense Management Data Center and the Total Force Data Warehouse for discharges of Marines from 1997 to 2002.

[118] MCOP1200.7Y. Military Occupations Specialty Manual, April 2003.

given for MOS because the variable was not coded correctly or defined. It was not possible, therefore, to classify the highest and lowest percentages discharged for failing to meet weight standard. (Refer table 1).

2000 Weight			**2000 Population**		
MOS	Frequency	Discharged for weight			Percentage
O100	administrative	9	O100	2484	0.362%
O300	infantry	7	O300	8260	0.085%
O400	logistics	3	O400	1085	0.276%
O800	field artillery	4	O800	1174	0.341%
1000	engineer/electrician	11	1000	3559	0.309%
2000	ordnance/electronics	14	2000	5577	0.251%
3000	supply/motor T/food service	7	3000	7000	0.100%
4000	computer specialist	3	4000	1032	0.291%
5000	musician/ NBC/police	18	5000	1747	1.030%
6000	aviation/meteorological	9	6000	5911	0.152%
7000	aircraft support/pilots	1	7000	1690	0.059%
8000	general service	1	8000	156	0.641%
		87			Percentage of the
		Other MOS's not included		6753	population 2001
		total pop out of 46428=		**46428**	**0.187%**

2001 Weight			**2001 Population**		
MOS	Frequency	Discharged for weight			Percentage
O100	administrative	7	O100	2698	0.259%
O300	infantry	5	O300	7908	0.063%
O400	logistics	4	O400	1041	0.384%
O600	command and control	3	O600	2339	0.128%
1000	engineer/electrician	5	1000	3701	0.135%
2000	technician/operators	18	2000	3109	0.579%
3000	supply/motor T/food service	17	3000	7373	0.231%
4000	computer specialist	10	4000	1291	0.775%
5000	musician/ NBC/police	2	5000	1847	0.108%
6000	aviation/meteorological	14	6000	5811	0.241%
7000	aircraft support/pilots	1	7000	1575	0.063%
9000	identifying and reporting	1	9000	6045	0.017%
		87			Percentage of the
		Other MOS's not included		2129	population 2001
		total pop out of 46867=		**46867**	**0.186%**

2002 Weight			**2002 Population**		percentages
MOS	Frequency	Discharged for weight			Percentage
O200	intelligence	3	O200	606	0.495%
O300	infantry	4	O300	8053	0.050%
O600	command and control	2	O600	2441	0.082%
1000	engineer/electrician	4	1000	3819	0.105%
2000	ordnance/electronics	3	2000	3467	0.087%
3000	supply/motor T/food service	9	3000	7436	0.121%
4000	computer specialist	4	4000	1434	0.279%
5000	musician/ NBC/police	2	5000	2004	0.100%
6000	aviation/meteorological	5	6000	6919	0.072%
7000	aircraft support/pilots	2	7000	1367	0.146%
		38		37546	Percentage of the
		Other MOS's not included		11262	population 2002
		total pop out of 48808=		**48808**	**0.078%**

Note: Light grey color indicates the lowest percentage of Marines discharged for weight.
Dark grey color indicates the highest percentage discharged for weight.
O300 Infantry had the lowest discharge percentage for weight for all three years.

Table 1. MOS weight discharges by year.

The data for FY2000 to FY2002 differed in Marines discharged for weight when compared to FY1997 to FY1999. Overall discharges fall steadily until FY2002 went up by more than 1,932 from the prior two years. However, weight discharge numbers decreased from 209 to 39. Several assumptions were determined as to why the data was different from 1997. First of all, the Marine Corps had a policy in place called stop loss in 2001. No Marine could be discharged to counter the possible shortage in manpower to support operations in Afghanistan, and Iraq. Secondly, since 9/11 commanders may have withheld Marines placed on weight control for a second or even third time from administrative discharge for weight. During times of conflict unit commanders need as many Marines as possible to fill vacancies. Another assumption was that the Marine Corps was improving the retention for remediation of RPCP Marines, with the implementation of the new physical fitness order.

In April 2003, a data set of 159 male Marines was collected to analyze the relationship of over and under weight Marines from the Marine Corps Detachment at the Defense Linguistic Institute. [119] Analysis of variance (Anova) and general linear model (GLM) procedures in SAS were run, as outlined in table 2. (Both Anova and GLM output were identical).

119 The data collected included the Marine's age, race, height, weight, neck and waist size, and the percent of composite bodyfat according to the Marine Corps Order (MCO) P6100.12, Marine Corps Physical Fitness Test and Body Composition Program (see appendix 2).

```
proc anova data=sasfile.fatness;
  class overfat overweight;
  model bodyfat = overfat overweight
overfat*overweight;
  means overfat*overweight;

The GLM Procedure

Level of     Level of              -----------BODYFAT-----------
OVERFAT      OVERWEIGHT      N             Mean          Std Dev

0            0              96       14.1354167       2.65813465
0            1              18       15.4444444       2.50228654
1            0              17       20.2352941       1.03255822
1            1              28       21.3571429       2.45272767

Overfat yes compared to underfat no with both underweight: Mean of

17.1853

Overfat yes compared to underfat no with both overweight: Man of

18.400 difference of 1.21 percent.
```

Table 2. Overweight and Underweight

In determining the difference in mean values by classification for bodyfat, an average of either group (with a sample of 159 Marines 45 being overfat and 46 being overweight, was used to weigh the means for comparison). If the subject was not overfat and not overweight, that mean was added to overfat and not overweight mean, to come up with an average bodyfat of underweight Marines for an average of 17.153 percent. Then a not overfat with overweight mean and the overfat with overweight mean was used to come up with an average of 18.4 percent. When weighted against each other the difference between overfat and underfat Marines is 1.25 percent. This is a remarkably

small difference between both groups. So in comparison with this sample, Marines who are underweight can be overfat.[120]

A sample analysis of underweight male Marines was compared to overweight male Marines had a high percentage of body fat close to the 18 percent maximum standard. The experts at the Naval Health and Research Center (NAVHLTHRSCHCEN) were asked; "whether Marines who meet the weight standards can also be over-fat?" this was done to determine if the data findings were uncommon. The NAVHLTHRSCHCEN was not surprised that they could be overfat and not overweight.

> It is possible for individuals with the same weight to have very different body fat percentages. This is due to differences in muscle mass. Therefore, weight for height tables can only go so far in screening for body fat. The Marine Corps weight for height tables may be a bit generous to allow for the increased muscle mass that many Marines have."[121]

The circumference method is discriminating between overfat and not overfat. This is clearly shown by the means in table 2, where both groups that were not overfat have mean percentages less than 18 percent, while both groups that were overfat have mean percentages greater than 18 percent. This is a confirmation of how the DoD circumference technique does work, on the population level when used by an individual with standard Marine Corps training in body comp assessment.

120 The Navy and Marine Corps currently use these equations to test for body fat: For women: %body fat = 163.205*LG10(sum)-97.684*LG10(htin)-78.387. For men: %body fat = 86.01*LG10(sum)-70.041*LG10(htin)+36.76 All measurements are taken in inches.

121 Interview with Doctor, K. I. Kujawa, December, 2003, Naval Health Research Center, San Diego, CA.

D. CHAPTER SUMMARY

The initial interviews with Marines from Headquarters and Service Battalion at Quantico Virginia, and the Defense Language Institute in Monterey California showed the need for program improvements. Marines in Remedial Physical Conditioning Program (RPCP), Body Composition Program (BCP), and physical rehabilitation have expressed psychological stresses and inconsistency or lack of structure associated while on such programs.

Remedial PT is a leadership challenge, where educating RPCP Marines should be a first priority. Mentorship form professionals and superiors will help direct RPCP Marines to increase their self esteem, thus giving them the extra boost and incentive required to motivate them to return to physical readiness standards.

When the question was asked: “how can we help Marines before they reach the point of no return?” set the stage for the individual to no longer wanting to be within standards. This is the point where a Marine made the conscious decision not to re-enlist. As stated earlier Marines look out for one another regardless of the cause. We take care of our own; so let us take care of everyone equally. Like a quality of life issue, let us give that “fat body”[122] the same chance as we would give someone placed in alcohol rehabilitation, or someone going to mandatory marriage counseling. This may still lead Marines who, even with help, do not care or are not willing to put forth the effort to return-to-readiness; these are the ones that need to be weeded out through attrition. Additionally, that number one Marine in the unit may be carrying 15 pounds of extra weight because of an injury that made it

122 Fat Body is an unwritten term Marines uses to describe someone on RPCP.

challenging to PT or injured while in the remedial program and now is unable to exercise at all.

The Former Commandant of the Marine Corps, General James L. Jones, has clearly stated his view of the importance of quality of life (QOL):

"When Marines are confident that the Corps' first instinct is to work for their benefit, they can concentrate on mission accomplishment. When our families share this confidence, they will contribute to mission accomplishment by being supportive of our way of life and calling."[123]

123 General James L. Jones 32nd Commandant of the Marine Corps.

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VI. CONCLUSION AND CONSIDERATIONS

A. CONCLUSION

The initial interviews with Marines from Headquarters and Service Battalion at Quantico Virginia, and the Defense Language Institute in Monterey California showed the need for program improvements. Marines in Remedial Physical Conditioning Program (RPCP), Body Composition Program (BCP), and physical rehabilitation have expressed psychological stresses and inconsistency or lack of structure associated while on such programs.

Marines do not appear to be well educated in regards to the body composition methodology. In personal interviews with remedial programs, it was apparent that not everyone in the program needed the same attention. Many Marines that were interviewed agreed there needed to be separate individual attention given to the RPCP Marine and not one program would work for everyone. A primary concern of the interviewees was that Marines were not given adequate help in nutrition, health, or fitness however; they were expected to “get with the program,” or they would be administratively processed for separation.

Currently the DoD and Marine Corps do not maintain matrices on Marines placed in RPCP. It is not quantifiable to determine weight impacts to readiness. The only matrices available are Marines that were discharged for weight and not those that were once in RPCP.

Additionally, studies done by the Department of Defense (DoD) have found the circumference method to be the best choice for body composition because of its accuracy and ease of use. Its regression formulas have been

validated against the four-compartment body composition analysis, which, with the different ethnic backgrounds found within the military, best predicts body fat percentage for the overall population.

Finally, the Marine Corps Order (MCO) 6100.12, Marine Corps Physical Fitness Test and Body Composition Program Manual (MCPFTBCP) detail several examples on how to help a Marine. However not every example will fit all RPCP Marines. To have a better fit with consistency MCPFTBCP does not go far enough. An expansion of existing Semper Fit programs could lead to a decrease in attrition an increase in retention through reduction of injuries by increasing fully fit for duty Marines and mission readiness.

B. CONSIDERATIONS

If the Marine Corps considers expanding its Semper Fit program to include mandatory screening for all RPCP Marines it would improve readiness and reduce the P2T2 account. Once a Marine is on a remedial program, he or she must be provided structured nutritional classes from a dietitian and meet with a personal trainer. This education would improve the Marine's self-awareness to health, nutrition, and fitness. These Semper Fit professionals would assist the unit commanders in developing the best fitness program for each Marine. The education would improve the individual's self esteem, improve Quality of Life (QOL), and show each Marine the Corps cares about their well-being.

The primary consideration is to turnover the RPCP program to Semper Fit. Marines in the program would report to one of many fitness classes offered by Semper Fit. These

classes are regularly offered several different times daily. Once implemented, Semper Fit could restructure their classes so RPCP Marines would choose morning, afternoon, or evening class four days a week. Semper Fit instructors could tailor specific fitness classes that target different areas in fitness during each class. A RPCP Marines would be evaluated through a stress and strength assessment given by a personal trainer, along with the recommendations from the dietitian and clinical exercise specialist. Each Marine has a special case that requires an individual assessment therefore the individual requires specially tailored fitness classes. Greater involvement of Semper Fit would minimize inconsistencies of remedial PT programs within different commands.

Additionally, and most importantly, Semper Fit run RPCP would provide consistency and the best fitness program tailored to the individual Marine's needs, and timely return to readiness standards. RPCP Marines would not see the constant turnover of Marines running and administrating the program. Commanders would be alleviated with the burden of administering their own RPCP program allowing them to focus on mission accomplishment. Turning this program over to the fitness professionals is the best choice. It would help to reduce the psychological stresses, poorly structured programs, constant turnover, and inconsistencies that RPCP Marines currently encounter at the unit level.

C. FURTHER STUDY

Further studies are recommended in cost benefit analysis, a stakeholder's impact study, and pilot program. These studies need to be conducted to determine the effects of implementing a policy change on how RPCP is conducted.

The cost benefit analysis would analyze the monetary benefit saved by a Semper Fit run RPCP. The approach would need to determine how many Marines were on the Body Composition Program (BCP) during their enlistment and decided not to re-enlist. This could be conducted by analyzing the exit surveys of discharged Marines. Furthermore, determining the number of Marines discharged for weight, plus those that were medically discharged and also in the BCP at some time during their most recent enlistment needs to be determined. Additionally, those that were in the BCP were successfully removed, and were unable to re-enlist due to boat spaces or poor personal reports would need to be analyzed.

An average of how many Marines would be discharged for not returning to readiness standard and those that were not happy with the structure of the program and decided to not re-enlist would have to be compared to a control group. This control group would have to be roughly the same size and same geographical location as the pilot group and of a non-combat category. An example of both the pilot group and control group could include a Marine Aircraft Wing (MAW) and separate similar squadrons within the MAW. Two Helicopter Medium Lift/Attack (HMLA/HMH) squadrons, two Marine Fighter Attack (VMFA) squadrons, and two Marine Aviation Logistics Squadron (MALS) or Marine Air Control Group (MACG) or similar would need to be compared to identical non-participating squadrons. At a minimum the study would have to run to cover an enlistment cycle and/or through one or more deployments. Initial results could be calculated after two years. The calculations would then be an average to base other non-combat units with overall discharge rates for RPCP Marines.

Additional research on the positive and negative impacts that Semper Fit would encounter with running the RPCP needs to be analyzed. What effects would the Marines attending a variety of fitness classes and fitness training, have on Semper Fit staffing and facilities. The results could ultimately affect funding for other programs within Moral Welfare and Recreation (MWR).

Stakeholders such as Marine Corps Training and Education Command (TECOM), Marine Corps Headquarters, Bureau of Medicine (BUMED), Morale Welfare and Recreation (MWR), and individual Marine commanders, have an influence and direct interest in all Semper Fit programs. Programming budget decisions are approved through HQMC and all funding requests are prioritized in the upcoming fiscal year Program Objective Memorandum (POM). Any program that Semper Fit would like to implement must first be approved through staffing and funding levels established by higher command.

F. SPILLOVERS

The effects of spillover of a new program could affect other programs or organizations and are difficult to predict; however, one must look at these effects closely. However, the end result may ultimately be a new and improved dependable RPCP. Once new policies are put in place, unforeseen spillovers can be addressed. To deal with these spillovers with regards to the RPCP, further studies must be done.

Once again, Semper fit’s purpose is to promote the optimal health, quality of life, and operational readiness of all Marines. The primary purpose is to help maintain a Marine’s physical readiness. Semper Fit does this through numerous fitness facilities that provide a Marine with a

nutritionist, physical trainers, weight training, and cardio impact classes. All of these programs are funded through Morale Welfare and Recreation (MWR). To implement a RPCP program that is run by Semper Fit would most likely require an increase in classes in cardio conditioning, the number of nutritionists and personal trainers on staff, and the size and numbers of fitness centers needed. This increase would require additional funding that would affect other MWR programs. It could also impact the “Quality of Life” programs for Marine dependents and other government workers throughout the Marine Corps. At the current level of support Semper Fit would now be required to assist in the remedial program, some classes and/or fitness facilities would not accommodate the user demand.

Another spillover effect is the effect on operational tempo. How would commands deployed, personnel on temporary active duty, or units not located on a Marine Corps Base (such as Marines stationed at Defense Language Institute), be able participate in a Semper Fit program? What program would individuals or commands implement to remediate Marines? A solution might be to send a representative to the training course given by Semper Fit, designed to develop personal trainers and clinical exercise specialists. This course could certify a Marine as a personal trainer and create a liaison with clinical exercise specialists and or physical therapists. This person could train his or her assists to help run the RPCP. The reason behind the clinical exercise specialist program is to have a liaison between the Marine and the physical therapist. A clinical exercise specialist is an additional qualification from a physical trainer. The physical trainer is trained in physical therapy to help rehabilitate injured

Marines. Although they are not medical doctors and cannot recommend corrective procedures without clearance from a doctor, they do however, work closely with Naval Medical to help alleviate patient load. Once a Marine is cleared from medical to begin rehabilitation they are assigned a Semper Fit facility, to start a program until their condition further improves. If for some reason, that Marine sustains another injury or the same injury recurs, they can return to Semper Fit for rehabilitation without having to be reevaluated by the medical staff. This relationship results in a fully-developed, implemented, and fostered health promotion program. This program would work hand-in-hand with BUMED in returning personnel to full readiness. This is the same procedure followed by the National Football League, where clinical exercise specialists work directly with rehabilitating injured football players.

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APPENDIX A. WEIGHT CONTROL/REMEDIAL PT INTERVIEW

1. Name_____ Rank_____ Unit_____ Age_____ Gender M/F
MOS _____ Marital Status M/S Children Y/N

2. How long have you been here? _____ Last unit you were in _____

3. Last Deployment Date_____ Ethnic Background (optional)_____

4. Years in Service_____ Do you plan on re-enlisting? _____

1. If not what are your top two reasons?

   1._____
   _____
   2._____
   _____

2. Type of Program you are in Weight Control, Remedial PT, Other please specify _____

3. How long have you been on this program? _____ First or second time?_____

4. History of weight problems prior to boot camp, during boot camp, and after if applicable_____
   _____
   _____

5. What was your best and worst PFT score? _____

6. Did you have to get in standards prior to joining the Corps? Yes or No

7. What do you think about the current program you are in?
   _____
   _____
   _____

8. What do you think about the neck and waist measurement?
_____
_____

9. Do you feel it is accurate? _____

10. Would you prefer another fat evaluation such as the seven-point caliper pinch method, which measures seven different areas on your body?
_____
_____

11. Have you been given outside professional help such, as Semper Fit classes? _____

12. If so are they mandatory? Yes or No

13. If so do you feel they have helped you or could help you meet Marine Corps standards?_____
_____

14. If not would you be interested in getting professional help? _____

15. What type of help do you think would increase your chances of getting back to Marine Corps standards?
_____
_

16. Would you be willing to get professional assistance from Semper Fit professionals in health, nutrition, and fitness?
_____

17. Do you think you’re over weight? Yes or No. If so why do you feel your overweight?_____
_____
_____
_____

APPENDIX B: MARINE CORPS HEIGHT AND WEIGHT STANDARDS (MCO) P6100.12

MALES

HEIGHT (Inches)	Maximum Standard (Pounds)	Minimum Standard (Pounds)
58"	132	91
59"	136	94
60"	141	97
61"	146	100
62"	150	104
63"	155	107
64"	160	110
65"	165	114
66"	170	117
67"	176	121
68"	181	125
69"	186	128
70"	192	132
71"	197	136
72"	203	140
73"	208	144
74"	214	148
75"	220	152
76"	226	156
77"	232	160
78"	238	164
79"	244	168
80"	250	173

Max BF%:	18%

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APPENDIX C: EXAMPLE OF MARINE CORPS BODY FAT ESTIMATION CHART (MCO) P6100.12

PERCENT BODY FAT ESTIMATION FOR MEN

Circumference Value*	Height (in)									
	60.0	60.5	61.0	61.5	62.0	62.5	63.0	63.5	64.0	64.5
13.5	9	9								
14.0	11	11	10	10	10	10	9	9		
14.5	12	12	12	11	11	11	11	10	10	10
15.0	13	13	13	13	12	12	12	12	11	11
15.5	15	14	14	14	14	13	13	13	13	12
16.0	16	16	15	15	15	15	14	14	14	14
16.5	17	17	16	16	16	16	15	15	15	15
17.0	18	18	18	17	17	17	17	16	16	16
17.5	19	19	19	18	18	18	18	17	17	17
18.0	20	20	20	19	19	19	19	18	18	18
18.5	21	21	21	20	20	20	20	19	19	19
19.0	22	22	22	21	21	21	21	20	20	20
19.5	23	23	23	22	22	22	22	21	21	21
20.0	24	24	24	23	23	23	23	22	22	22
20.5	25	25	25	24	24	24	24	23	23	23
21.0	26	26	25	25	25	25	24	24	24	24
21.5	27	27	26	26	26	26	25	25	25	25
22.0	28	27	27	27	27	26	26	26	26	25
22.5	29	28	28	28	28	27	27	27	27	26
23.0	29	29	29	29	28	28	28	28	27	27
23.5	30	30	30	29	29	29	29	28	28	28
24.0	31	31	30	30	30	30	29	29	29	29
24.5	32	31	31	31	31	30	30	30	30	29
25.0	32	32	32	32	31	31	31	31	30	30
25.5	33	33	33	32	32	32	32	31	31	31
26.0	34	34	33	33	33	33	32	32	32	32
26.5	35	34	34	34	34	33	33	33	33	32
27.0	35	35	35	35	34	34	34	34	33	33
27.5	36	36	36	35	35	35	35	34	34	34
28.0	37	36	36	36	36	35	35	35	35	34
28.5			37	37	36	36	36	36	35	35
29.0					37	37	37	36	36	36
29.5								37	37	36
30.0										
30.5										
31.0										
31.5										
32.0										
32.5										
33.0										
33.5										
34.0										
34.5										
35.0										

* Circumference Value = abdomen circumference - neck circumference (in inches)

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   Naval Postgraduate School
   Monterey, California

5. Lieutenant Commander Kathleen I. Kujawa, Ph.D.
   Research Program Manager, Naval Health, and Research Center Department of the Navy Point Loma, California

6. Catherine Ficadenti
   Semper Fit Health and Fitness Center
   Quantico, Virginia

7. Marine Corps Representative
   Naval Postgraduate School
   Monterey, California

8. Director, Training and Education,
   MCCDC, Code C46
   Quantico, Virginia

9. Director, Marine Corps Research Center,
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